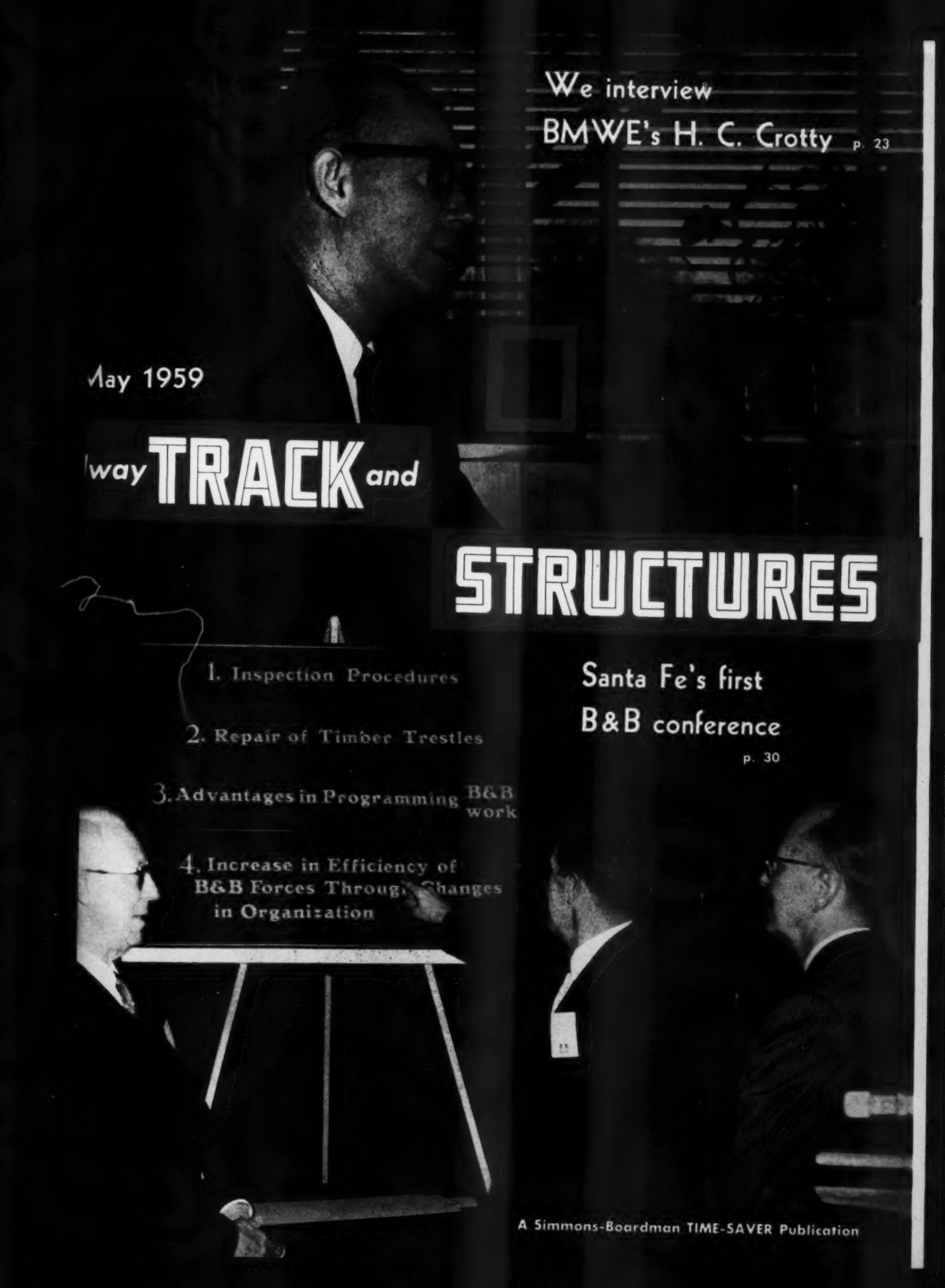

We interview
BMWE's H. C. Crotty p. 23

May 1959

Railway TRACK and STRUCTURES

1. Inspection Procedures
2. Repair of Timber Trestles
3. Advantages in Programming B&B work
4. Increase in Efficiency of B&B Forces Through Changes in Organization

Santa Fe's first
B&B conference
p. 30

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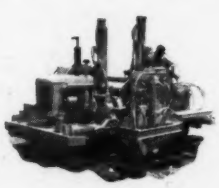

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Member, Audit Bureau of Circulations (ABC). Indexed by Engineering Index, Inc.

in this issue:

vol. 55, no. 5 MAY, 1959

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In an exclusive interview with RT&S editors, BMWE President H. C. Crotty speaks frankly of the union's objectives.

Problems in ballast renewal on bridges 27

How ingenuity and careful planning paid off for the B&M in replacing the ballast on single-track, slab-topped, stone-arch bridge.

Santa Fe's first B&B maintenance conference 30

This road's supervisory officers have a better understanding of its B&B problems as the result of a two-day meeting.

Are section forces necessary? 34

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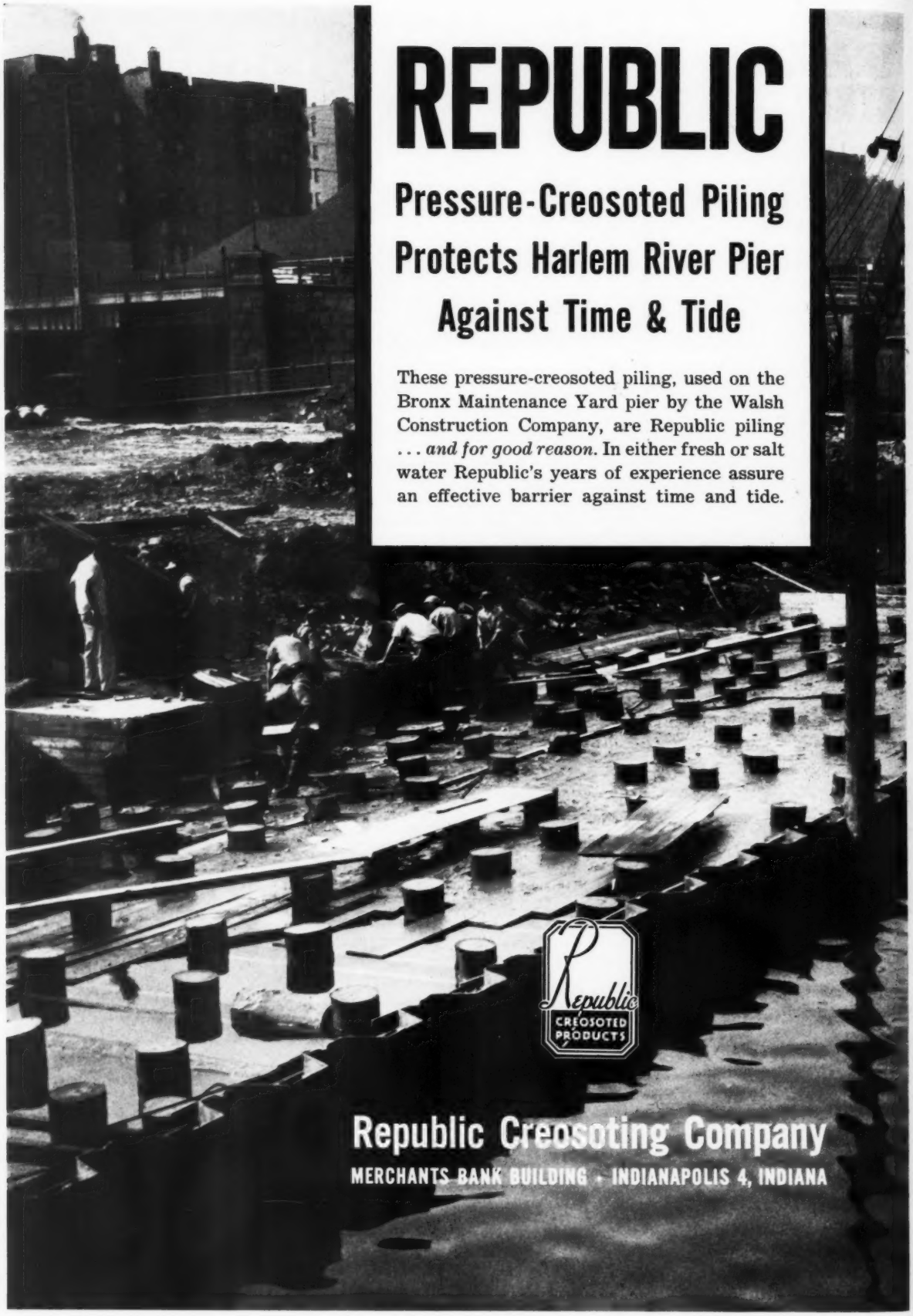
DON'T MISS . . .

Track-surfacing gangs on the Southern Pacific, using leased equipment, are working two shifts daily. The road feels it is realizing important advantages from this practice, including the fact it is getting maximum use of the equipment during the period of the lease agreement.

. . . in the June issue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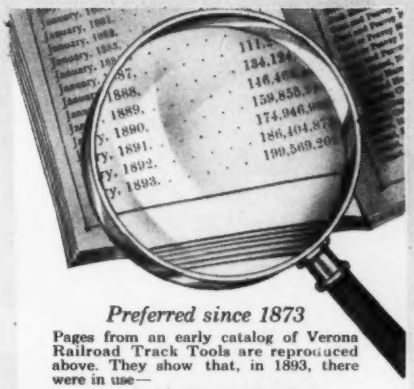

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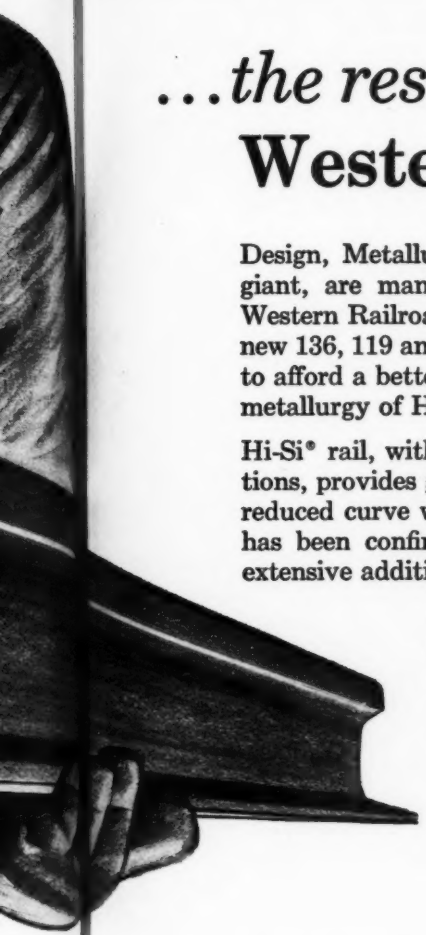

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News about people

BALTIMORE & OHIO—James P. Ray, regional engineer at Cincinnati, Ohio, retired February 1 after nearly 49 years of service. **Charles A. Waskey,** track supervisor on the Baltimore division, retired after more than 49 years of service.

BESSEMER & LAKE ERIE—J. B. Wackenhut, assistant engineer, has been promoted to construction and contract engineer succeeding **B. H. Price, Jr.,** who has been promoted to heavy maintenance and equipment engineer at Greenville, Pa. Mr. Price succeeds **C. W. Morrison** who has been appointed assistant engineer. **R. E. Kuban,** designing engineer, has been named senior designing engineer. **V. D. Maxwell,** draftsman, has been promoted to the position of office engineer.

CANADIAN NATIONAL—H. J. Fast, assistant chief engineer at Montreal, Que., has been temporarily assigned to the department of research and development as coordinator of work study with headquarters as before.

Ronald C. Gillespie, assistant to district engineer at Moncton, N. B., has been promoted to division engineer at Edmundston, N. B., succeeding **R. J. Tingley** who has been promoted to assistant engineer of track, system, with headquarters at Montreal, Que. **G. L. Field,** division engineer at Montreal, has been appointed general maintenance inspector, system, with headquarters as before. **M. F. Keith Leighton** has been promoted to division engineer at Moncton succeeding **Bryce Keays** whose promotion to budget officer of the Atlantic region was announced in the April issue. **C. W. Wagner,** track standards assistant, has been appointed engineer of tests, system, with headquarters at Montreal.

CANADIAN PACIFIC—G. P. Beach, division engineer at Brandon, Man., has been appointed acting assistant district engineer with headquarters at Winnipeg, Man. **Sidney C. Baker,** roadmaster at White River, Sask., has been transferred to Union Station, Toronto, Ont.

CHESAPEAKE & OHIO—Horace S. Purdom, district engineer at Huntington, W. Va., has retired after 42 years of service. **Harold Veldheer** has been appointed assistant bridge and building supervisor at Grand Rapids, Mich.

DENVER & RIO GRANDE WESTERN—Neal A. Pine has been appointed assistant supervisor structures at Denver, Colo., succeeding **William J. Brookshire** who has been promoted to supervisor structures at Salt Lake City, Utah. Mr. Brookshire succeeds **Keith W. Bradley** who has been promoted to design engineer in the general offices at Denver.

ERIE—The position of track supervisor, Subdivision No. 2, Delaware division, with headquarters at Susquehanna, Pa., is abolished. A portion of this subdivision has been transferred to Subdivision No. 1 under the jurisdiction of **H. S. Trenholm,** track supervisor. Concurrently, a portion of the Wyoming division has been transferred to Mr. Trenholm's jurisdiction and his headquarters have been changed from Port Jervis, N. Y., to Callicoon.

The balance of Subdivision No. 2 has been transferred to Subdivision No. 1, Susquehanna division, under the jurisdiction of **G. D. Stoddart,** track supervisor at Binghamton, N. Y.

Fred Williams, general foreman, Wyoming division at Dunmore, Pa., has been transferred to Sub-division No. 1, Susquehanna-Delaware division, Susquehanna, Pa.

GREAT NORTHERN—K. E. Wyckoff, office engineer at Seattle, Wash., has been promoted to assistant to the chief engineer with headquarters at St. Paul, Minn.

LOUISVILLE & NASHVILLE—James B. Clark, assistant director of personnel, has been promoted to chief engineer succeeding **Howard C. Forman** who has been promoted to assistant general manager.

NEW HAVEN—A. T. Peagan, assistant general manager—engineering, has been promoted to vice president—operations.

NEW YORK CENTRAL—George P. Stanske, assistant engineer at Jackson, Mich., has been promoted to field engineer with headquarters at Indianapolis, Ind. **R. G. Triller,** assistant engineer at Buffalo, N. Y., has retired after 43 years of service.

Wolters Ledyard, division engineer at Chicago, has been transferred to New York City succeeding **James D. Fraser** who has been promoted to district engineer there. Mr. Fraser succeeds **Joseph L. Cox** who has retired after 46 years of service.

NORTHERN PACIFIC—F. B. Mallas, assistant engineer at St. Paul, Minn., has been promoted to division engineer at Duluth, Minn., succeeding **D. F. Bartley** who has resigned.

NORTH WESTERN—E. J. Grall, roadmaster at Iron Mountain, Mich., has been transferred to Marinette, Wis., succeeding **T. J. Fielder** who died on March 14.

ROCK ISLAND—J. B. Skidmore returned from leave of absence on April 5 and has been appointed roadmaster at Enid, Okla., replacing **Grady Davis** who has returned to his former position of track supervisor at Biddle, Ark.

ST. LOUIS-SAN FRANCISCO—M. Day has been appointed assistant roadmaster with headquarters at Tulsa, Okla.

SANTA FE—E. C. Smith, assistant engineer at Amarillo, Tex., has been appointed assistant office engineer there succeeding **George R. Vanderpool** who has been promoted to the newly created position of bridge engineer, Western Lines, with headquarters at Amarillo.

SOUTHERN—Herbert W. Smith, assistant engineer at Washington, D. C., has retired.

Biographical briefs

Frank M. Kaylor, 34, who was recently promoted from division engineer to superintendent on the Southern at Charleston, S.C. (*RT&S,* Feb., p. 10), was born at Appalachia, Va., and received his higher education at King College, Virginia Military Institute and the University of Maryland. He entered railroad service with the Southern in 1940 as a section laborer at Bristol, Va. In 1947 Mr. Kaylor was appointed student apprentice at Atlanta, Ga., and the following year he was promoted to assistant supervisor there. Mr. Kaylor was further promoted to bridge and building supervisor at Valdosta, Ga., in 1949 and to assistant division engineer at Knoxville, Tenn., in 1954. The following year he was advanced to division engineer at Charleston, S. C., and in 1957 he was transferred to Greensboro, N. C., where he was located at the time of his recent promotion.

Joseph R. Leguenec, 65, who recently retired as division engineer on the Cotton Belt at Tyler, Tex. (*RT&S,* Jan., p 10), was born at Abbeville, La. and graduated from North Carolina State College in 1915 with a Bachelor of Science degree in civil engineering. He started his railroad career in February 1916 as a transitman with the Gulf, Colorado & Santa Fe. Mr. Leguenec served in the U.S. Army from March 1918 to February 1919 when he returned to the GC&SF in his former capacity. In 1920 he joined the Cotton Belt as a transitman, later serving as roadmaster, bridge and building supervisor and assistant division engineer. In 1928 he was promoted to resident engineer and in 1935 to AFE engineer. He was appointed division engineer in 1951, which position he was holding at the time of his recent promotion.

Alfred R. Penney, 53, who was recently promoted to district engineer on the Canadian National at St. John's, N. F. (*RT&S,* Mar., p. 10), was born at Carbonear, N. F. He began his railroad career on the Newfoundland Railway, now part of the Canadian National, in 1938 as assistant road engineer. He was promoted to road engineer three years later and further promoted to assistant chief engineer in 1947. Mr. Penney was appointed assistant district engineer on the Canadian National in 1949 and division engineer at St. John's three years later, the position he held at the time of his recent promotion.

P. H. Croft, Jr., 31, who was recently promoted to supervisor of trains and tracks on the Illinois Central at Kankakee, Ill. (*RT&S,* Feb., p. 10), was born at Christopher, Ill., and received a Bachelor of Science degree from the University of Illinois in 1951. Mr. Croft commenced his

(Continued on page 66)

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UREABOR can prove to be your most practical way of keeping any area weed-free! It offers all the features you want in a weed killer... convenience, safety, economy, and lasting effectiveness. With this granular dust-free material, one easy application—dry—at low rates of 1 to 2 lbs. per 100 sq. ft. gives you full season control.

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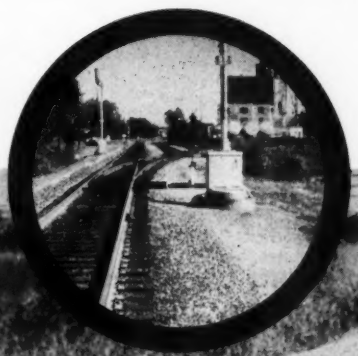

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News notes...

. . . a résumé of current events throughout the railroad world

A proposal to cut wages 15 cents an hour is the carriers' answer to operating union demands for a 12 per cent increase. Railway managements also want to eliminate the cost-of-living escalator clause from existing agreements. Guy L. Brown, grand chief of the BLE, says "their proposal is ridiculous." Talks are now ready to move into the conference stage.

•

Net income of Class I railroads for February showed nearly a $30 million gain over the corresponding month last year. The roads estimate that net income will be $19,240,000 as compared with a deficit of $10 million in the previous year. For the first two months of this year, the estimated net income and net railway operating income were $40 million and $76 million, respectively. This compares with $5 million and $41 million in 1958.

•

Carloadings are expected to total about 8.2 million for the second quarter of 1959, according to estimates made by the 13 Regional Shippers Advisory Boards. This will be an increase of about 12 per cent above the corresponding period of 1958. Because of increased business car-repair programs and orders for new cars are on the increase. In anticipation of increased business the B&O has taken on additional employees for the repair of cars and diesel locomotives. The Reading has also recalled a considerable number of shop workers.

•

Legislation governing the operation of motor cars was given another boost when the ICC advised it favored the enactment of a bill giving it authority to prescribe rules. The commission so advised Senator Magnuson, chairman of the Senate's Interstate Commerce committee. The commission is convinced that the continuance of motor-car accidents shows that existing AAR recommended operating rules, which were adopted by the majority of its member roads, are "inadequate to provide the necessary protection."

•

Sharpest criticism of the ICC in some time came from C. M. Roddewig, president of the Association of Western Railways. He assailed the commission for its failure to accord the railroads more rate-making freedom. Government regulation of the railroads has been "a complete failure," he said, and the nation's transportation bill "is far more than it would be" if government permitted freer play of competitive forces. Milwaukee Road's President W. J. Quinn also decried the attitude of the lawmakers who have authority to modify regulations. His point: There's far more obsolescence in government regulations than there is in the equipment or practices of any up-to-date railroad.

•

Integrate, become cost conscious and eliminate all unneccessary expense from operations was the advice of Representative Oren Harris, chairman of the House Interstate & Foreign Commerce Committee, to the transportation industry. He considers transportation integration "the most challenging" issue for the industry and "one which will contribute the most to our national welfare."

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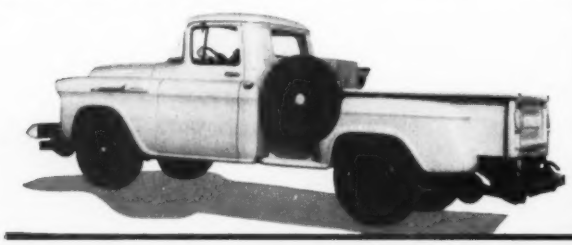
Rugged construction includes rubber cushion torque unit

Easily adjustable . . . with cushioning effect . . . that bars on-rail noise—the rubber cushion torque unit is one more reason why Fairmont Manual Hy-Rail equipment gives the rugged kind of service railroad men demand. Manually operated on either rails or highways, the guide wheels are raised or lowered with minimum effort due to the added leverage that is built into the operating linkage. The load bearing equipment has heat-treated cast steel wheels with tapered roller bearings on independent action frame and uses a manual steering lock, mounted on the steering column. Available for ½ and ¾ ton vehicles, the Fairmont Manual Hy-Rail is of proven design, made of quality materials by a producer who has many years' experience in manufacturing these units. The equipment is supplied in three ways: a field application group to be mounted by the purchaser . . . applied by us in our shops to vehicles owned by railroads . . . or furnished as a complete unit consisting of truck with rail equipment in place. For details, contact your Fairmont representative now.

Fairmont HY-RAIL equipment in highway position has a clean-cut appearance, is well protected and has good road clearance.



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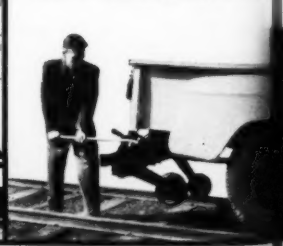

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Helps from Manufacturers

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CRANE-EXCAVATORS. A specification bulletin is available which describes and illustrates the new series "350" Bantam crane-excavators. The bulletin, 350-1, gives specifications, capacities and work ranges on carrier-mounted, self-propelled and crawler-mounted models. Features of each are described. Specifications are also included for the various mountings available and for the clamshell, dragline, shovel, back-hoe, pile-driver and tamper attachments. (Write: *Schield Bantam Company, Dept. RTS, Waverly, Iowa.*)

TRACTOR PARTS. A new 8-page booklet describes and illustrates the Caterpillar Boralloy sprockets and steel disc idlers. The three-color booklet, D868, is entitled "Power and Guidance" and describes the various design characteristics and manufacturing processes that give the parts the features they possess. An on-the-job report is included which compares the performance of the Boralloy sprockets with the old-style sprockets. (Write: *Caterpillar Tractor Company, Advertising Division, Dept. RTS, Peoria, Ill.*)

ALUMINUM SIGNS. A new 8-page illustrated booklet is available which describes the features and advantages of extruded aluminum crossbucks, roadway, station identification and temporary signs, mounting posts and aluminum fasteners. The booklet, entitled "Railroad Crossbucks and Signs," includes information and data on engineering and installation as well as a list of the available shapes and sizes. (Write: *Kaiser Aluminum & Chemical Sales, Inc., Dept. RTS, 919 North Michigan Ave., Chicago 11, Ill.*)

NON-SHRINK GROUT. The advantages of using Embeco non-shrink grout are pointed out in a 16-page bulletin now available. Bulletin E1D describes and illustrates the material and gives its measurable characteristics. Also covered are the mixing and placing of grout, cold and hot weather grouting, recommended mixes and estimating tables and suggestions for the selection of sand, cement and aggregates. Some of the common methods of grouting equipment are included. Several charts are presented which compares Embeco grout with plain grout. (Write: *The Master Builders Company, Dept. RTS, Cleveland 3, Ohio*)

METAL PRIMER. A folder is available which describes and illustrates the features and advantages of the new Sherwin-Williams Metalastic Primer for structural steel. The characteristics of the primer are included in the 4-page folder. Also shown are the finish-coat colors in which Metalistic Enamel is available. (Write: *The Sherwin-Williams Company, Dept. RTS, 101 Prospect Ave., Cleveland 1, Ohio*)

WHEEL TRACTORS. An operator's manual is available for the Oliver 770 and 880 tractors. The manual describes and illustrates the operation of the machines and includes an alphabetical index, a list of 34 safety rules, lubrication chart and diagrams, and specifications for both tractors. Description of the machines is divided into the following sections: Tractor, engine, fuel system, ignition and electrical, cooling system, clutch, transmission, steering, wheel equipment and optional equipment. The manual has many pictures which show the component parts of the wheel tractors. Schematic diagrams are utilized to explain the fuel, wiring and cooling systems. (Write: *The Oliver Corporation, Dept. RTS, 400 West Madison St., Chicago 6, Ill.*)

FIRE EXTINGUISHERS. The features of fire extinguishers are described and illustrated in a new 6-page folder. Entitled "A Guide to Fire Extinguishers" the folder contains a table which compares the characteristics of the various types available and a bar graph which shows the comparative effectiveness of extinguishing agents according to Underwriters' Laboratory ratings. Two cut-away drawings show a dry chemical extinguisher and a stored-pressure water extinguisher. (Write: *Ansul Chemical Company, Fire Equipment Division, Dept. RTS, Marinette, Wis.*)

Dear reader:

RAILWAY
TRACK and STRUCTURES

When problems stand in the way of progress

Progress in almost any field of endeavor nearly always creates new problems. Sometimes these new problems are used as excuses or reasons for not adopting progressive practices. It is conceivable, of course, that difficulties presented by a proposed new practice may be such as to nullify its advantages. Whether this is so, however, can only be determined by a thorough and unbiased study made for the purpose of determining (1) the overall economy and suitability of the new practice, and (2) whether practicable and economical solutions can be found for any new problems that would be raised as a result of its adoption.

This situation has been occurring with great frequency in the maintenance-of-way field as a result of the revolutionary changes that have been introduced in recent years in equipment, methods and organization. Practically all of them have brought new problems. And sometimes the apparent formidable nature of these problems has caused particular railroads to reject the new practices in spite of the economies that would derive from their use.

A comment frequently heard from maintenance men after inspecting something new on another road goes like this: "They are saving money all right but did you see what they are running into . . .?" The implication here is that the other railroad adopted the practice without considering all the factors involved and then ran into difficulties, but is continuing the practice because those responsible don't want to admit they made a mistake. Perhaps this has happened but the important thing to determine is whether there is a practicable solution to the problems "they are running into." In other words, such problems should not be considered insurmountable until an earnest effort is made to solve them.

All sorts of examples can be cited to illustrate this situation. Continuous welded rail is one of them. The use of such rail introduces a variety of problems, and these have been used as reasons why it should not be adopted. The occurrence of pull-aparts at joints between long strings is one of the difficulties sometimes mentioned. Should a railroad deprive itself of the economies of welded rail simply because pull-aparts have occurred on a road using it? Or would it be wiser to approach the matter from the standpoint of finding out whether pull-aparts can be prevented?

Along the same line, objections can be raised to the practice of programming maintenance, especially that involving B&B work, but the real question is whether these are of sufficient importance to warrant abandoning the idea. Also plenty of objections can be found to the elimination of section gangs, but should not ways be sought for overcoming them before deciding not to adopt a more economical M/W organization? Readers will have little difficulty adding to this list.

At a time like the present, when there is urgent need for economy, the burden of proof is not entirely on those who are advocating cost-saving methods. Those who object should be required to prove the validity of their point of view, too.

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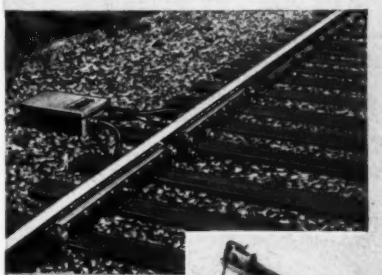

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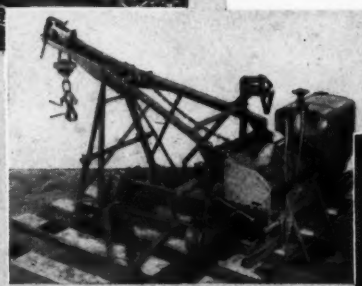

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R-1315 RRRR

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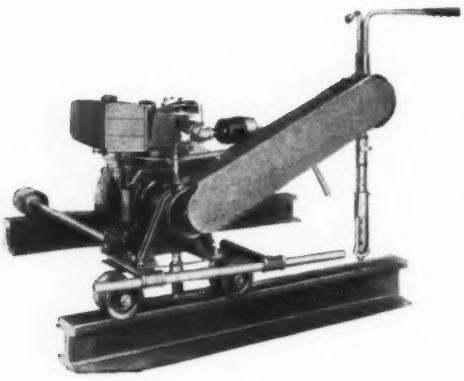

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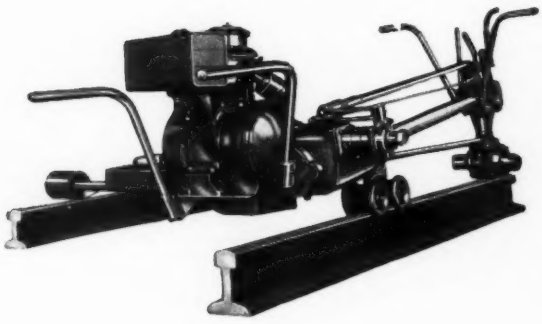

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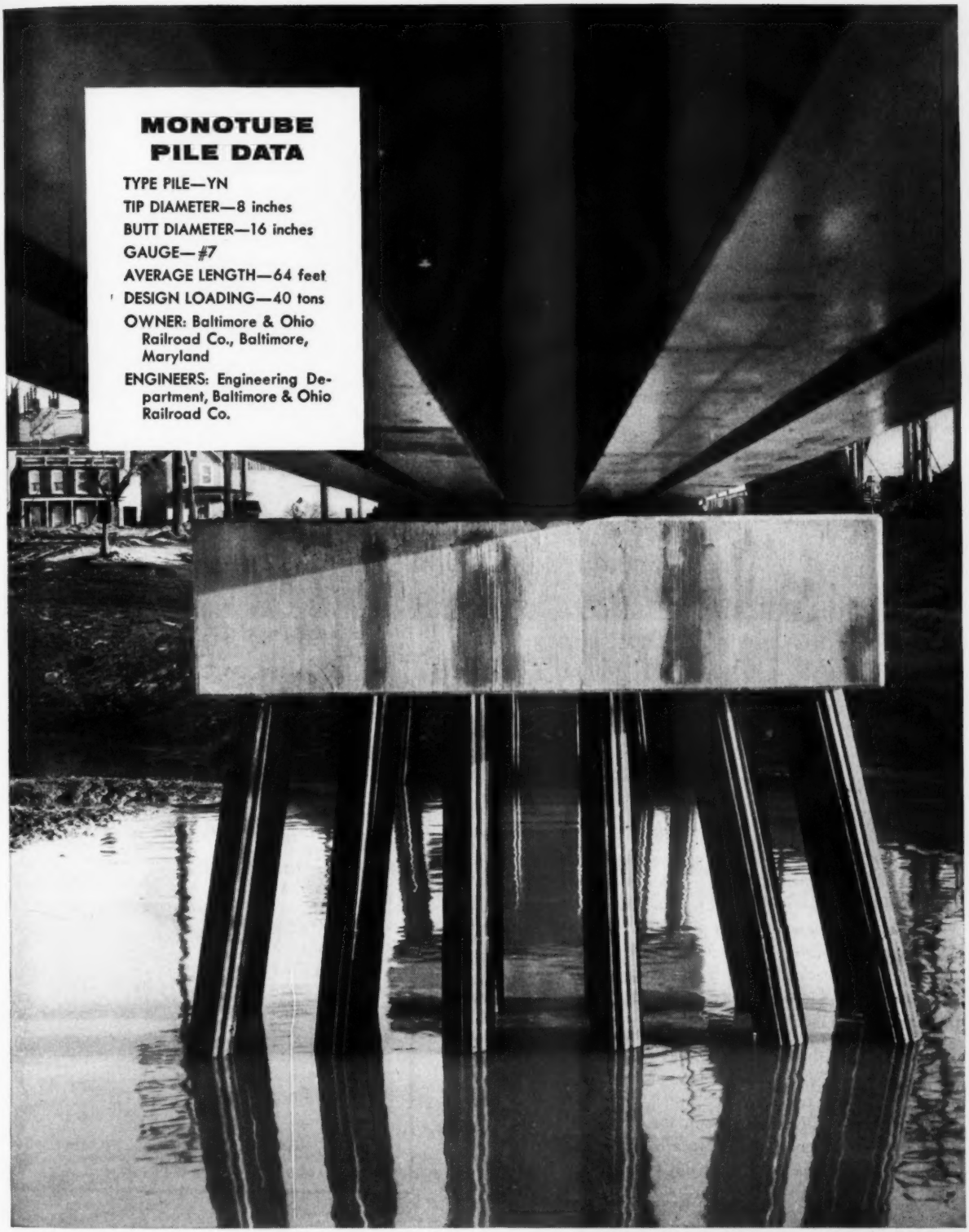

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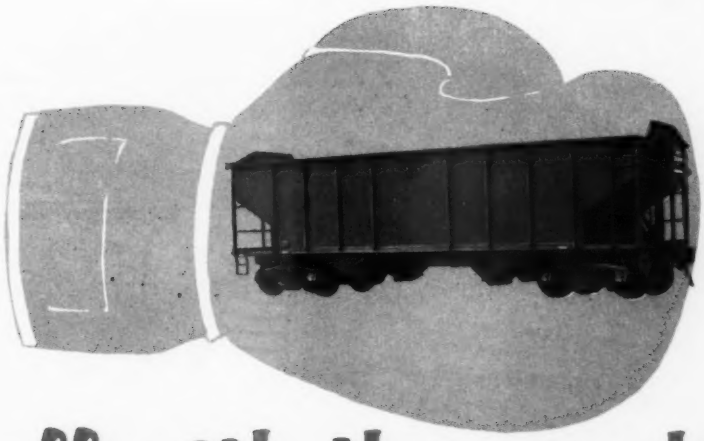

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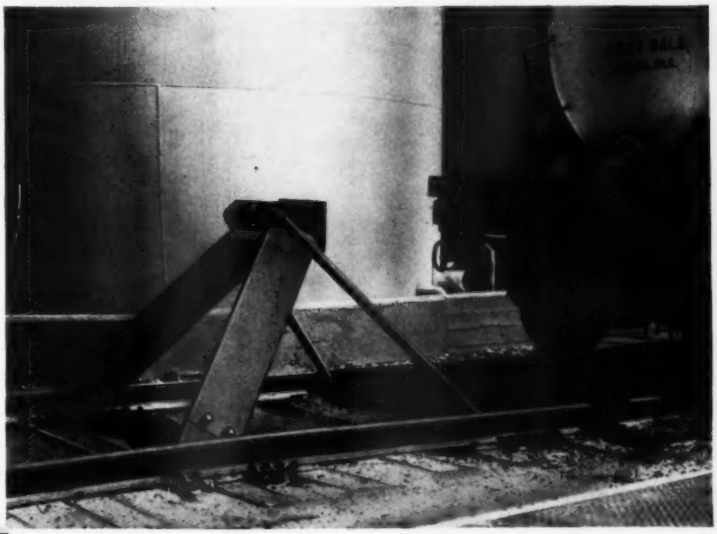

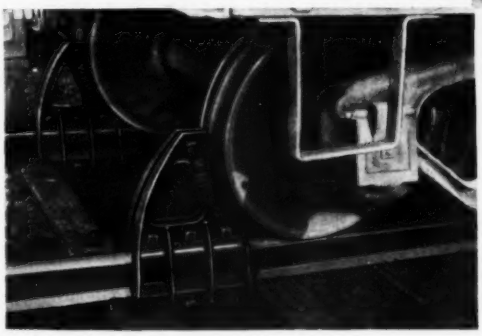

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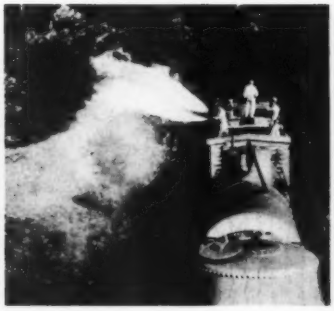
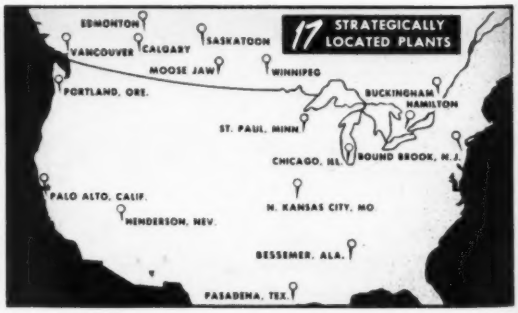




RAILWAY TRACK and STRUCTURES

M/W employees . . .

What the Brotherhood wants

An exclusive interview with BMWE President H. C. Crotty

Important issues are pending between the railroads and the Brotherhood of Maintenance of Way Employes. The Brotherhood is waging a battle for stabilization of employment, and other demands are being prepared. To ascertain the thinking of the union on these and other matters the Brotherhood chief was interviewed by *RT&S* editors. Here is a verbatim report of the interview.

Q. Mr. Crotty, in May 1957 the Brotherhood served Section 6 notices involving 10 proposed rules changes. What is the status of these notices at the present time?

A. The notices to which you refer were served on May 22, 1957, on all railroads in the United States with which we have agreements. The negotiations at the individual railroad level have been completed and out of some 345 railroads with which we hold agreements we have only been successful in disposing of the notice on two small properties. In the rest of the instances the matter is still under consideration. Services of the National Mediation Board have been invoked and we're seeking as expeditiously as possible to try to conclude the negotiations.

Q. They may be concluded within this calendar year?

A. We are going to make every possible effort to conclude them prior to the end of this year.

Q. On November 1 the moratorium provision of the current agreements expires. Can you tell us when new demands may be served in advance of the expiration of that moratorium?

A. Our program has not as yet been finalized. But I believe it's reasonable to expect that action will be taken by this Brotherhood and by other non-operating organizations to launch their programs prior to November 1, 1959.

Q. How does the Brotherhood of Maintenance of Way Employes arrive at its contract demands?

A. They have their roots in the wishes of the membership as expressed at subordinate lodge meetings. They are then handled on the individual railroad by our organization on that particular property. They, of course, have the approval of our international association prior to the time they are handled collectively on all of the railroads.

Q. There have been some indications from various parts of the non-operating group that the major emphasis this year is going to be on matters of stabilization of employment rather than on wages. Do you have any comment to make on that?

A. I think it's reasonable to expect that the emphasis will be on stabilization of employment and on wages and on other so-called fringe matters that have been hanging fire for the last three years.

Q. You wouldn't put the emphasis on one rather than the other?

A. I think it's fair to say that all facets of the program will be emphasized.

Another moratorium?

Q. Contracts that have been agreed upon this year in Canada have included provision for the contract to cover more than one year. Do you think it's possible that there may be another moratorium written into U. S. contracts?

A. We've had some experience with a moratorium during the last three years here in the States. To be perfectly frank about it, that portion of the moratorium that had application to rules changes as opposed to wage changes has not worked out as contemplated. When the November 1956 agreements were made, the employee representatives, including myself, were of the opinion that we had protected our right to negotiate on rules changes other than those specifically barred by the moratorium during the term of the agreement. Unfortunately, during this

The proposed rules

Here, as summarized by Mr. Crotty, are the 10 rules the Brotherhood of Maintenance of Way Employes served on the railroads in May 1957:

(1) **Force reduction.** This rule would require that seniority shall govern both in laying off employees and in recalling them to service; that a minimum of five days written advance notice would be given to employees affected by force reduction; that monthly rated employees would not be laid off before the end of the month and hourly rated employees would not be laid off before the end of a week.

(2) **Seasonal variations in employment.** Would provide for cooperative conferences between the railroad company and the general chairman with a view toward establishing a more stable work force. It would outline some methods by which this can be accomplished.

(3) **Organizational changes in work methods.** Under this rule negotiation and agreement between the management and the general chairman would precede organizational and work methods changes that affect the working conditions and earnings of the employees.

(4) **Change in track section limits.** Would provide for consultation and agreement between the railroad company and the organization before track-section limits are rearranged and it would enumerate the points on which agreement should be reached.

(5) **Mechanized track gangs.** Under this rule conference and agreement between the railroad company and the general chairman would precede the establishment of mechanized gangs.

(6) **Maintenance-of-way machines.** Would require that when a new type of machine is to be placed in operation, a rate of pay will be agreed upon in advance. Employees would be permitted to learn to operate the machine at company expense, and the position would be filled in line with seniority.

(7) **Travel allowance and expense for week-end trips home and expenses away from home.** This rule would allow employees assigned to live in camp cars or trailers travel time to and from their home stations over the week-end. It would reimburse them for any transportation expense incurred and the cost of meals away from home.

(8) **Rates of pay.** This proposed rule would place a standard and comprehensive rate-of-pay rule in each agreement.

(9) **Contracting of maintenance of way and structures work.** This rule was designed to control the contracting out of work by the railroad company by providing that work coming within the scope of the agreement shall not be let to outside contractors except by agreement between the railroad and the general chairman.

(10) **Severance pay.** Would extend to employees who are separated from the railroad industry the protective conditions stipulated by the Washington Job Protective Agreement of 1936.

What the Brotherhood wants (Cont'd)

three-year period the moratorium has been used by railroad managements as a vehicle to delay the day-to-day collective bargaining that we thought we had preserved. I do not foresee any set of circumstances at the present time which would permit me—and I think I could speak for the rest of the non-ops when I say that we would refuse to agree upon a moratorium governing rules changes, although we might give favorable consideration to a moratorium on wages if the proper safeguards could be included.

Q. Proper safeguards would include what?

A. They would include an escalator clause to protect against increases in cost of living, a productivity increase clause to permit the employees to share in any increased productivity and if the agreement were over a long term, it would necessarily have to include annual wage increases that would reflect the upward trend of the standard of living.

What about strike ballot?

Q. Some time ago a strike ballot was distributed to members of the Brotherhood. What is the status of that action?

A. I assume you are referring to the stabilization of employment issue. We did take a strike ballot on all of the railroad properties where we hold agreements. Through that ballot the employees have directed us to secure an acceptable stabilization of employment agreement through negotiation if possible, and through the exercise of economic strength if we're not successful in doing it across the bargaining table.

Q. It's conceivable then that the Brotherhood might be involved in negotiation of two separate rules movements this summer—the 1957 movement and a 1959 movement which might be instituted?

A. If we are unable to dispose of our stabilization of employment dispute prior to the time that conferences might be held on a 1959 program there is a possibility that we would be handling two matters concurrently. I trust that this will not come to pass.

Q. In your rules demands, you mention training sessions for the members of the Brotherhood. What specific type of training do you have in mind?

A. We find ourselves using new types of machines in the maintenance-of-way department that were unknown until recent years. I think that it's the belief of the engineering department officers of most railroads that their operation is somewhat different from that of machines our people ordinarily operate—similar but different in certain respects. We believe that it's a matter of mutual interest that they be instructed in their operation.

Q. Over and above the training they'd get on the job during the trial period?

A. If the objective could be accomplished through actual use of the machine on the job, then of course there would be no necessity for training. It's only in those instances where the training would be desirable, both from the standpoint of the employer and the employee that the rule would have application.

Q. On your Rule 4 regarding section limits—when railroads extend the limits, isn't it generally true that a section force's duties are reduced to track patrolling and to light chores and their responsibilities are not increased?

A. I assume you're referring to the forces that remain on the extended section. The change in methods, of course, deprives the men who formerly worked on that section of job opportunities, and the job opportunities are usually transferred to a mechanized crew that works over the territory where the section was previously located and over an extended territory. But in a like sense the number of men in a section crew is materially reduced. I do not believe that the decrease in responsibility in the aggregate in any way removes from the section foreman or the men who might remain in the crew their proportionate share of the responsibilities. In other words, the responsibility of the remaining employees is as great or greater than it was prior to the time that the territory was extended and the forces reduced.

Q. Mr. Crotty, frequently a road will try out a brand new machine on an experimental basis. Does the rule require that a prior conference with the general chairman for establishing the operator's rate of pay take

place before that experimental period?

A. The rule is not intended to restrict the right of any management to try out new machines. When the determination is made by railroad management that a machine is to be purchased or retained, we think that is the desirable time for them to start training their own employees to operate it.

Establishing operator pay rates

Q. How is the rate of pay for the operator of a new machine established? Suppose a machine is developed to set and drive tie plugs for rail gang use—a brand new machine. One operator does the work of eight men formerly required to do this work. Let's say the machine cost $20,000. How would you establish a rate of pay?

A. When you speak of an entirely new type of machine I think that we are visualizing a situation that doesn't often come to pass. I think that most machines that come into the industry are related in some way, to some degree, to machines that we already have in operation and machines for which rates of pay have been established. And I think that the rates of pay on the similar machines that we already have serve as a basis for negotiating a proper rate of pay on the machine that performs a somewhat different function.

Q. Machinery is now widely used by the maintenance forces of the railroads as a means of promoting efficiency and controlling expenses. What is the position of the Brotherhood toward this development?

A. We as a Brotherhood do not oppose the introduction of machinery as such, if it's introduced under proper circumstances and the welfare of the employees who are to be affected by its use is considered. I do believe that a number of the railroads have mechanized without enough forethought and without due consideration to the welfare of the employees affected. I think you will find that the cost of the machines and their depreciation has, in many instances, exceeded what it would have cost, had the machine not been purchased, to have a standard of maintenance that perhaps exceeds the standard that is maintained after the machine is put in use. In other words, I don't believe that just because a machine has a lot of gadgets on it that it should be purchased without proper trial and due consideration. We have reports from our officers and members in the field of a number of instances where a considerable amount of money has been put into maintenance-of-way machines and where those machines are now idle.

Comments on track conditions

Q. You mention standards. Do you think our standards today are lower than they were when we were doing maintenance work mostly by hand?

A. I am absolutely convinced that the standard of maintenance on the railroads of the United States in the aggregate is lower today than it was ten years ago.

Q. Specifically, in what areas?

A. I refer specifically to track surfacing and alinement. I think the riding quality of the track has been considerably reduced since the advent of the machine. This doesn't mean to imply that the machine is responsible. I am of the opinion that the standard of maintenance in the M/W department has deteriorated in recent years. I also believe that my opinion is shared by a majority of the railroad officials in the engineering department. A number of railroads have adopted a program for maintenance-of-way operations that provides for the performance of certain duties on a given area of trackage by years, with lighter repairs being made in between. I do not believe that this method produces the standard of maintenance that we had prior to the adoption of the program. I also think that the deferred maintenance accounts of the railroads—which on most individual properties is considerable and which in the aggregate is staggering — tend to bear out this theory. I would suggest that railroads give careful consideration to a lesser period of time, if they are going to adopt the cycle method of performing their M/W work.

Work to be done in winter

Q. What gainful work can the trackmen do on the northern roads during the winter? How much of this work is there to do?

A. I again believe that engineering department officers would favor a stabilized work force perhaps more than other officers of the railroad

Trackman to Brotherhood chief

Harold C. Crotty entered railroad service in 1929 as a trackman with the Chicago & North Western. He moved up through the ranks, serving as assistant track foreman and track foreman.

He was elected assistant general chairman of the Brotherhood, C&NW system, in 1945. Three years later, he was brought into the grand lodge organization, first as a deputy and later as assistant to the grand lodge president.

For several years, he was assigned to the preparation and presentation of members' cases before the National Railroad Adjustment Board. Seven years ago, he was brought into Brotherhood headquarters as right-hand man to former President T. C. Carroll. He served as Mr. Carroll's representative in national wage movements and in almost all other BMWE activities.

Mr. Crotty was elected president in June 1958 and took over as head of the union last September 1.

What the Brotherhood wants (Cont'd)

would. I think there are a number of jobs that could be performed in the winter. Among them are the laying of rail; the day-to-day care of the track, which would include changing of angle bars, bolts, and care of the right of way. And, with proper drainage and rock ballast, there is no reason why track could not be surfaced during the winter months. I have noted with considerable interest that several responsible representatives of railroad engineering departments have advocated that track surfacing could be done in the winter. I feel very strongly that any job in the bridge and building department could be performed in the winter months. I think it's desirable to schedule all interior work during the cold weather. But, there's no reason why jobs that must of necessity be done outside could not be done in the winter months, perhaps with greater efficiency than in the summer months.

Q. Even pile driving?

A. I know of no set of circumstances under which piles could not be driven in the winter. In the building industry a number of years ago contractors were of the opinion that building work should cease with the first frost. In recent years the building industry has found that they can continue to perform their functions expeditiously and as efficiently in the winter as they did in the summer. On the railroads we are somewhat antiquated in our thinking in this respect. Although it might be unusual to do some of these things in the winter, it certainly is not impossible.

Q. Mr. Crotty, how long is the qualifying period for a machine operator?

A. The vast majority of our working agreements provide for a qualifying period of 30 to 60 days. That's generally the rule.

Always a qualified operator

Q. Is it conceivable that, owing to the ages of the available senior men on the seniority district, none can be found to qualify to the railroad's satisfaction?

A. I think somebody is seeing ghosts where there aren't any. I think that the railroads would have little difficulty in finding a well-qualified man on any seniority district that they may have. I couldn't visualize any

"THROUGH that (strike) ballot the employees have directed us to secure an acceptable stabilization of employment agreement . . ."

set of circumstances where they wouldn't be able to find an acceptable man.

Q. Most machines make the work for the trackmen and the bridge and building men less arduous. Shouldn't this be taken into consideration in establishing rates of pay?

A. Well, of course I don't agree with your premise. In the first place, I think that the operator of the machine performs a very arduous function. In a like sense I don't believe that rates of pay should be geared to the amount of muscle a man has or is required to use. If we follow that thinking we would be paying a man who operated a pneumatic tamper more money than the foreman who supervised him or the division superintendent.

His views on subsidies

Q. What is the attitude of the Brotherhood toward the plight of the railroads relative to competition from subsidized forms of transportation and regulation by the ICC?

A. We agree with the position of the railroads with respect to subsidies to competing forms of transportation. We have worked with them and we have taken public positions favoring legislation that would either curtail the subsidies to the competing forms or place the railroads in a fair competitive position. We agree with them wholeheartedly in their fight to preserve the railroads as a private enterprise operation as well as to place their competitors in a comparable position.

Q You are aware of the attitude of the present administration in Washington regarding the inflationary spiral of wages and prices. What is your thinking about this situation?

A. We, of course, realize that the inflationary trend the last two years particularly has been very pronounced and is very undesirable. Our preliminary studies indicate that within the last two years inflation has taken over $200 in the aggregate out of the pockets of our members. We believe that we have to have a growing economy and that a growing economy must of necessity have a slight degree of inflation. But we feel that the inflationary spiral has been too rapid and that it's contrary to the best interests of the country as a whole and railroad people in particular. We trust that this administration or some other force will be able to control it.

Use of operating personnel

Q. Do you have any comments to make on various agreements in effect which require the employment of operating personnel on certain classes of track maintenance equipment?

A. The requirements you refer to are not too numerous when you consider the number of railroads in the country. I don't believe that the amount of money expended by the railroads in placing operating personnel on M/W equipment is a major factor in the financial picture. We as a Brotherhood, of course, want to have a safe operation. If a railroad company and an operating brotherhood have reached agreement on use of operating personnel on M/W equipment and if the use of the operating employee doesn't deprive M/W employees of their job rights, then we, of course, would not raise any objection to their use nor would we feel we had any place in even speaking on the question. In the overall picture I doubt that it's too important in the labor relations field.

Q. One engineer of maintenance of way has said that having these operating men on his machines amounted to 1/5 of the cost of doing the work on a particular job.

A. Well, if a particular railroad has rules that they think are oppressive, then the Railway Labor Act is open to them and they ought to try and change them.

Problems in ballast renewal . . .

This article was submitted for publication in the "What's the answer?" department in answer to the question: "What is the most economical method for renewing cemented ballast on concrete-slab trestles when other repairs are not required?" Mr. O'Sullivan describes in detail the procedure he used on a slab-top stone-arch bridge, and four other jobs in less detail. Other answers appeared in April.

By **William B. O'Sullivan**
Track Supervisor
Boston & Maine

. . . And how they were solved

. . . On a single-track stone arch

● During 1958 we had occasion to plan in detail the complete renewal and replacement of badly cemented ballast on a single-track, slab-topped stone-arch bridge 190 feet long.

The original multiple stone-arch span is over 100 years old and had pre-fab, reinforced-concrete panels installed on its upper surface in 1930. Ballast guards were cast integral with the slabs and the stone ballast removed last year was installed as a part of this 1930 job.

The job was a complete renewal from bottom up including new ties, plates, tie pads, rail, and track fittings.

The single-track main line supported by the bridge has an average of 5.6 trains per day during the normal work period, two of which are first class.

Maximum available time on track on this line cannot be expected to be more than two hours. Because of this factor, it was decided to remove the track and replace it with preassembled panels.

Material was brought gradually to the site via dump truck and a trailer of the utility, pole-carrying type. Material was loaded on the truck or trailer at the storage yard some miles distant whenever there happened to be a self-propelled crane working under flag protection in the yard on some other job. There was no work-train expense involved in either delivering the new material or picking up the old. Of the old material the salvageable rails were used as main-line replacement in the area following routine Sperry test. The scrap ties were picked up by local people.

After the delivery of the new material was completed, a crew of eight men was assigned the task of building the new panels off to one side. A level area near the track, reasonably close to the bridge, was somewhat limited and it was necessary to build the required six panels in three pairs, the second panel on top of the first in each pair. To build higher than two panels was impracticable as all rail handling was undertaken by this eight-man crew. The construction of the panels, including the guard rails, took a total of 16 hr.

The same crew, plus a welder, prepared the track to be removed by sawing one in-track rail so as to obtain a square joint just off the bridge at the north end. One of the cut pieces was then carried to the south end and the gap was bumped-closed to produce square joints across the entire bridge to just off the south end. This work was accomplished in eight hours.

The bridge guard rail was then torch-cut to match the squared running rails. Additional joints were applied to the guard rail as required and were fully bolted.

This was the last preparatory operation and the work on the bridge was started the next day.

Two cranes are used

Two locomotive cranes were used on the job, operating out of a side track several hundred feet south of the bridge. The cars, loaded with stone ballast for this job, also were stored on this two side-track complex.

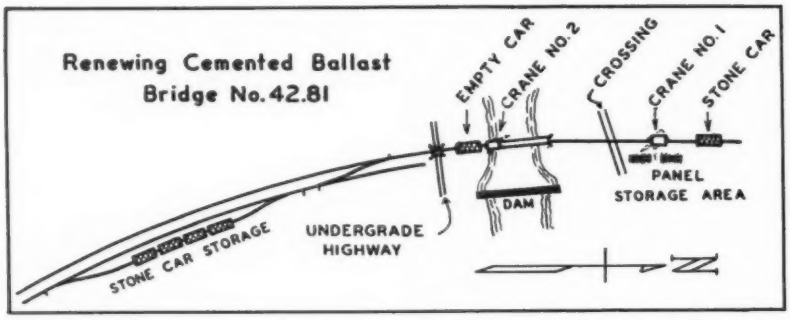
One hour and half was considered the minimum time needed to remove a panel, do the cribbing, replace the ballast and install the new panel.

When this period appeared available, flags were placed and both cranes proceeded out of the side track. The first or lead crane moved out with a car of stone ahead of it and the second followed with an empty car behind it for loading the waste ballast.

The lead crane ran over the bridge to a point just beyond the new panel-storage area and uncoupled its cars of stone. Following this it returned to the bridge and picked up the panel to be removed. This panel was taken several hundred feet north and placed in the clear near the new panels for future dismantling. The crane then returned with a new panel.

In the meanwhile the second crane commenced loading the cemented ballast. After removing the material from half the gap, the crew performed the

Problems in ballast renewal (cont'd)



STEP 1—Crane No. 1 moved out of siding (left), pushing car of stone across bridge where car was uncoupled. It returned to bridge, picked up a track panel, carried it to storage area, and set it in clear.

STEP 2—Crane No. 2, towing empty car, also moved out of siding and picked up old ballast from gap, loading it into car behind it. Men shoveled dirt left by crane over side of deck and opened up slab drainage.

STEP 3 — First crane brought new track panel from storage area and set it in place while second crane switched out its car of dirt and returned with car of new stone. Lead crane obtained its car of new stone.

STEP 4—Both cranes unloaded stone ballast. Track was tamped by hand and both cranes returned to siding. Total time required for changing out each track panel was about 1 hr 50 min.

necessary hand work to clean the residual dirt down to the bare concrete, throwing the shovelled waste towards the crane bucket.

A good deal of the fouled ballast could be wasted over the side of the bridge onto the stream banks. However, nearly half had to be loaded to avoid stream contamination.

Consideration was given to the idea of applying an asphaltic membrane on the surface of the concrete when it was bared. This idea, perforce, was abandoned when inspection of the uncovered slabs revealed them to be in excellent condition with negligible spalling, but also soaking wet. To have dried the concrete sufficiently to make a successful application of the membrane material would have consumed far more time than was available. However, every effort was made to clear the joints between the slabs so that the deck would drain.

By the time the lead crane returned with the new panel, the gap would be nearly devoid of ballast. When all this material had been removed, the new panel was lowered into place. While it was being connected, the second crane returned to the sidetrack, switched out the car of dirt, and returned with a full car of stone.

Placing new ballast

A part of the hooking-up operation was the blocking up of the panel to an elevation about 2 in below the final grade at the center of the panel. This was to allow the bucketed stone to run under the ties and still leave room for the track to be raised to its final grade.

After placing the new panel, the lead crane moved back off the bridge and had it's bucket reeved. It then helped in placing the new stone, using the car previously placed north of the job site. This crane did not handle much more than 20 per cent of the stone placed. But, every bucketful it did unload reduced the burden of the other machine and got the panel completed quicker.

All of the new stone was placed by bucket from the cars because there was not enough side clearance to permit working the cars in the usual way with pans. Open-hopper dumping and plowing with a timber under the car wheels were not considered because of the shortness of the opened track (39 ft) and to avoid choking the track with stone. Any stone left in the cars was unloaded on ballast jobs elsewhere on the division.

Following the placement of the stone, the second crane ran back to clear and the track was raised to approximately the proper elevation. The stone was tamped under the ties by using hand tools.

The lead crane, having had its bucket removed and stored in the clear for work on the next panel, moved south over the new work and into the sidetrack also. Whereupon, the track was then released to traffic at a speed of 10 mph. This slow order was in effect for the entire job and was retained until the final surfacing on the whole bridge was accomplished.

Time required

A time analysis of each operation, averaged for all the panels, reads as follows:

Lessons learned on these jobs

There are certain inescapable conclusions to be drawn from participation in the work:

1. Where the use of the track can be obtained from the operating people or where traffic conditions permit extended track occupancy, and where waste ballast can be cast over the side, a wheeled front-end loader will outpace a locomotive crane every time. Even in cases where the waste has to be loaded it appears that a front-end loader expedites the work of a crane by heaping the waste for full bucket loading.

On the two bridges cited where the front-end loader was used successfully, the depth of fouled stone ballast beneath the tie bottoms did not exceed six inches.

2. We did not have a chance to use a treaded front-end loader. But, by comparing our performance records in hard digging, they seem to show that they might be even more efficient than wheeled vehicles. The latter units have a tendency to slip their wheels when the going is tough.

3. The decks of the five bridges discussed were, in order, concrete slab, treated timber, steel plate, and treated timber. All these bridges were rebuilt to their current state in either 1929 or 1930 so that the decks were 28 or 29 years old. It was astonishing to see the excellent condition of all decks. The timber decks were, apparently, as good as the day they were installed.

Remove old panels	10 minutes
Crane crib and hand clean	50 minutes
Hook up new panel	20 minutes
Placement of new ballast	20 minutes
Trueing surfacing and finish rough tamp	10 minutes

This can be compared with six hours to hand-crib half a rail to the deck (cribs and tie ends only) by the eight-man crew, as an exploratory operation.

This bridge is on a curve and there were 14 in of stone below the tie bottoms on the high side.

Final surfacing of this bridge, the staggering of the new rails, and the incidental turning of all the old flange-worn rail remaining in the curve was accomplished by a 10-man crew in 24 hr.

. . . And on four other structures

Another approach was developed employing a front-end loader on a double-track through-truss span, four rails long, where train time was not a factor. On this job stream contamination was not interdicted and the waste materials were dumped over the side through the truss members all along the bridge.

Work on this bridge encompassed tie as well as ballast renewal, one track only, and 16 men worked on it for two 10-hr days at the rate of two rail lengths per day. For this bridge the track was not preassembled in panels.

Another short bridge, 80 ft long, also was cleaned last summer. This structure was a through-plate girder having a steel floor and mortared-brick ballast guards and carrying one track of a two-track line. It was cleaned, as part of a "dead-track" operation, by a locomotive crane and a truck crane.

This job, including retieing, was handled in an eight-hour day by 20 men, two crane operators, and crane chauffeur. Because this bridge was short, the track was taken apart and rebuilt by hand.

Advantage was taken of a previously established "dead-track" setup with pilot service which had been in effect as part of ballasting operations elsewhere in the vicinity on the same track.

A fourth bridge, a Warren deck truss 15 rails long and carrying two tracks on its stone-ballast deck, was completely cribbed in the fall. This was done one track at a time using a front-end loader and wasting all the material over the side. This work, progressed on a "dead" track specifically set-up for the job, advanced at the rate of three 39-ft panels (with squared joints) per day.

There were 16 men on this job. New panels were built in the clear just off the bridge while the cribbing was underway, using the rails off the old panels on the new ties.

Total time required to crib and replace ballast only was 10 days, divided into two separate five-day periods. Ballast was placed each day on the three panels by a locomotive crane pushing hopper-bottom cars. Hopper doors on these cars were chained to control the flow of ballast and the new stone was spread by using two new ties riding on the top of the rails and moved along by the wheels of the car being processed.

A fifth structure, a single-track through-truss six rails long, was cribbed and retied entirely by hand under traffic in six days by a nine-man crew.

BALLAST on this double-track deck, 15 rails long, was changed out in 10 days.

At the completion of cribbing and timbering the track structure rested on the timber deck, with traffic moving at greatly restricted speed.

Two more days were necessary to unload new stone and resurface, employing 12 men. Depth of fouled stone under the ties at the start of work was about 4 in and the old ballast was wasted over the side of the bridge.

It is interesting to compare this completely manual job with some of the foregoing descriptions of variously mechanized work.

By comparing the daily progress on this job with that reported for the first cited concrete-slab top, it will be apparent that the choice of method was determined by the amount of fouled ballast to be removed, traffic being approximately equal.

From the foregoing description it might be safely assumed that we had some experience last season cleaning off ballast-deck bridges of nearly every conceivable type.

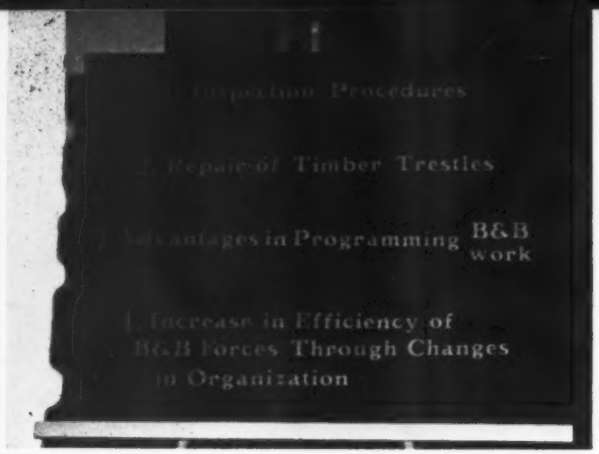
We did not use a bucket on either of the timber decks. But, having observed the bucket action on the steel and concrete floors, it is a safe assumption that a front-end loader is far less destructive.

4. There is no better time to re-tie than when the entire track structure is removed from the bridge. Real economies can be realized if this is handled by moving the trackage on and off the bridge in panels. Even further savings can be made if enough time is available to build the panels intermittently as men are available conveniently. On the first cited through-truss, the track was entirely disassembled and reassembled, two rail lengths at a time, and it was exceedingly slow.

5. Under certain conditions there is no reason to doubt that 117 ft of bridge deck can be cleaned off and the track restored to restricted-speed services by an eight-man crew plus two equipment operators.

These conditions include a six to eight-hour occupancy of a piece of track, the use of a front-end loader, the wasting of the old material over the side of the structure, enough room to safely unload the new stone ballast conventionally, and the handling of the track structure in pre-fab panels.

This premise includes a moderate amount of travel time for the crew. It also assumes the use of a locomotive crane to power the unloading of new ballast, with the crane protected by an operating department flag crew.


Repair of Timber Trestles
Advantages in Programming B&B work
Increase in Efficiency of B&B Forces Through Changes in Organization

The Santa Fe's first

B&B maintenance conference

The what and why of the conference

● The object of the conference was to increase the productivity and efficiency of the Santa Fe bridge and building forces, both from the construction and maintenance standpoint, by improved work methods.

Along with consideration of these possibilities the road was faced with a more specific bridge-maintenance problem that pointed to a need for advance planning on a systemwide basis. This problem stemmed from the fact that the Santa Fe has a total of 140 single-track miles of timber trestles, and an investigation revealed that about two-thirds of all B&B time was being spent on these timber-trestle bridges. These facts led to the conclusion that much could be gained by a better understanding on the part of B&B supervisory officers of the problems involved in the inspection, repair and renewal of timber trestles.

With these problems in mind R. H. Beeder, system chief engineer, some months ago requested C. H. Sandberg, bridge engineer of the system, to "look into the possibilities of improving the productivity of our B&B efforts." As this investigation progressed the desirability of improvement in planning and organization became increasingly evident. Out of the investigation also came ideas and recommendations as to the means for bringing about the desired improvement. At the same time it became evident, in the words of Mr. Beeder, "that no one person was going to come up with all of the answers, nor were these answers going to be equally applicable to all parts of the system."

There remained, then, the problem of not only presenting the ideas and recommendations developed to those responsible for carrying them out but also of getting from them additional ideas and suggestions. In this connection it is necessary to realize that the Santa Fe is a large system (more than 13,000 miles of main tracks) and that it is divided into four semi-autonomous "grand divisions" — Eastern

Here's what they talked about

R. H. BEEDER, sytem chief engineer, started conference with opening address.

"I know that a great deal of time, thought and effort have gone into the preparation of this conference. If you will match this with your ideas and experience, we can make some real headway toward solving our B&B problems."

With these words R. H. Beeder, the Santa Fe's system chief engineer, set the mood and the stage for the road's B&B maintenance conference. They were uttered during a brief opening address made by Mr. Beeder as the first session of the conference convened at 8:00 am on February 2. The location was the auditorium in the general office building of the road's Western Lines at Amarillo.

Nearby as Mr. Beeder spoke was a large easel-mounted chart on which were listed the four main topics to be discussed during the conference. These topics were explained more fully during the course of introductory remarks made next by C. H. Sandberg, bridge engineer of the system, under whose direction the conference was prepared and carried out. The four topics as rephrased by Mr. Sandberg, were as follows:

(1) Inspection procedures and the analysis and evaluation of inspection findings to insure getting the full service life out of all portions of a trestle.

(2) Repair of timber trestles, and "here some unnecessary as well as necessary repairs will be called to your attention for discussion."

(3) Advantages of programming B&B work. "This is a topic that we know will lead to considerable discussion. We hope to point out how programming can help

Engineering and supervisory officers who are responsible for the maintenance of bridges and building on the farflung Santa Fe system now have a clearer conception of the problems facing them and of the steps to be taken in dealing with those problems.

This understanding has come about as the result of a conference held in February at Amarillo, Tex., a central point on the system.

Engineering officers of the road are convinced the conference achieved its purpose which was to "stimulate thinking and discussion of our mutual problems concerning B&B maintenance work so as to improve our overall effectiveness."

Lines, Western Lines, Coast Lines and the Gulf Lines. With these lines reaching from Chicago to the Pacific Coast and south to the Gulf of Mexico, it is apparent that conditions of climate and terrain vary widely between different parts of the system.

Out of these circumstances came the idea for a systemwide conference of engineering and supervisory officers with responsibilities for the design, construction and maintenance of bridges and buildings. The decision was made to arrange a two-day conference to be attended by the chief engineers, district engineers and certain other engineering officers from the grand divisions, and all division engineers, general bridge and building foremen and their assistants, and bridge inspectors. For various reasons the conference was divided into two sessions, with a different group attending each two-day session. The dates set for the two sessions were February 2-3 and February 5-6, and each of them was attended by 38 officers.

Details of the program and the material to be presented and discussed were prepared by members of the chief engineer's staff. The agenda was built around these four main points:

(1) Inspection procedures and the analysis of inspection findings.

(2) Repair of timber trestles.

(3) Advantages of programming B&B work.

(4) Increase in efficiency through changes in organization.

Immediately following the presentation on each of the main topics those present were divided into four groups which met separately, each under a designated chairman, to discuss the ideas and material presented. In one group were the chief engineers, district engineers and other officers of similar rank. In another were the division engineers, while the other two were mixed groups of general B&B foremen and bridge inspectors. Following the meetings of these groups each of the chairmen summarized the comments and conclusions of his particular group before the main body of the conference.

Presentations on the main topics were prepared and presented by members of Mr. Beeder's staff. Also prepared for distribution to all those attending the conference was a portfolio of general information and sketches that were to be projected in the form of slides during the presentations. Included in the portfolio were several pieces of literature dealing with tools and equipment mentioned in the discussions.

Following the conference a complete report on the proceedings was prepared and distributed to all those who had attended and to other interested persons. Included in the report were a program of the proceedings, transcripts of all the addresses and presentations, digests of the group discussions and reproductions of the drawings, tables and photographs presented as slides during the various talks.

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you get needed equipment and additional forces, where necessary."

(4) Increase in efficiency of B&B forces through changes in organization.

A number of graphs were used by Mr. Sandberg to explain the reason for emphasizing timber trestle work at the conference, and to give "a picture of the job ahead of us in repairing and rebuilding these trestles."

Mr. Sandberg then got into the actual business of the conference by a discussion of the design and loading of beams and bridges and of pile driving. His thought was to spend a few minutes on these subjects so that his later remarks about inspection, analysis and repair would be clear.

Following a brief discussion of the E ratings of various classes of diesel locomotives, and the relative strengths of ballast-deck and open-deck trestles, Mr. Sandberg got into a discussion of damaged piling. By means of slides he showed several piles subjected to excessive compression stresses, attributed to attempts made to straighten the piles during driving. To avoid such practice, he said, "we should consider preboring and jetting when driving in difficult material." When a pile starts to drift off line, he added, "it should be straightened right away, and when the pile is bent by moving the leads, it shouldn't be hit as hard when driving is first resumed."

Inspection procedure

The conference next swung into a discussion of the inspection of timber trestles, the analysis of inspection findings and the repair of timber trestles. The material on these subjects was offered in the form of three separate presentations by F. E. Schneider, assistant engineer.

C. H. SANDBERG, system bridge engineer, told of the job ahead in trestle work.

THIS GROUP PICTURE shows the officers in attendance at the first two-day session.

Santa Fe B&B conference (cont'd)

Taking up the subject of inspection first, Mr. Schneider at the outset made these points about inspection procedure in general:

- Safety should be the first consideration in making an inspection.
- The purpose of any inspection is to properly evaluate the physical condition of the structure and note and record all the defects.
- Visual inspection is the first step.
- Any defects found by visual inspection should be further checked by sounding timber with the knob end of an inspection bar or a light-weight hammer.
- Timber has a tendency to decay or rot at points of contact with other timbers, with ballast and with the ground.
- The inspector should be alert for evidence of termites, carpenter ants or other destructive insects.
- Care should be taken against mistaking the discoloration of timber as rot. Such discoloration in stringers is more often a creosote stain.
- Borings should be made with an increment borer to secure a core sample of such nature as to eliminate guesswork as to the quality and thickness of the sound timber remaining in the member.

Mr. Schneider then discussed the things to look for when inspecting stringers, caps and bracing and piles. He noted that the most vulnerable part of the pile is at or just below ground line, "especially the piling in the dump bents and in the slope of the ground where piles are subjected to wetting and drying, and where the ground line has been raised or lowered."

Concluding, he summarized the main parts of trestles and how they should be inspected, as follows:

For stringers: Visual inspection for crushing to determine rot, and for splits and breaking. Occasional boring only if necessary.

For caps: Visual inspection for crushing under stringers or over piles, and for splits and breaking, and if shimming is required, noting if piling is the cause for any or all of the above defects. Bore as required.

For bracing: Visual inspection for rot and effectiveness of bolts and connectors.

For piles: Visual inspection for rot, splits and driving. Boring and exposing below ground to determine sound timber remaining.

Analysis of findings

In his discussion of the analysis of inspection findings Mr. Schneider pointed out that the defects, weaknesses and decay found during the inspection of a structure must be properly analyzed for their effect on the strength of the structure and decision made whether to strengthen, repair or "carry" the structure.

Referring to stringers he said it can be assumed that a decayed stringer is in no immediate distress until it shows evidence of crushing over the caps at the bearing points. Next he described several tests of stringers, some of which contained considerable rot. "All of these tests have proven," he said, "that there is no loss of strength with age in sound timber and little loss of strength in old timber with minor decay and defects."

Crushing of caps under stringers or caps over piles is quite prevalent, stated Mr. Schneider, but this is usually not the direct result of the cap, but is caused by defects elsewhere. "Settlement or driving piles can punish the cap severely since the cap, as a trestle member, distributes the stringer load to the piles." He cited an example of a cap that failed due to the bent being higher than adjacent bents, which caused it to get a great deal more than its share of the load from the stringers due to continuity.

Pointing out that properly braced piles carry practically nothing but direct load, Mr. Schneider made this observation: "We consider that if we have a 7-in diameter core, or a 3-in outside shell remaining in a decayed pile, the allowable load on the pile will not be exceeded."

The group discussions that followed Mr. Schneider's presentations on inspection and the analysis of inspection findings covered such points as piling that don't conform to specifications, knowing when to stop driving piling to avoid overdriving, the need for a drill point to get through rock seams or into hardpan, the pointing of piles and the use of metal points. Also discussed were the possibility of blocking piling on cars instead of loading them solid, the use of inspection forms, the makeup of the annual inspection party, the relative advantages of the increment borer and a brace and bit for determining the internal condition of members, and the question of how deep to dig down when inspecting piling below ground.

Repair of timber trestles

The repair of timber trestles, also presented by Mr. Schneider, was the next feature on the program. In this discussion he first discussed the use of helper stringers where existing stringers appear in a weak condition but inspection indicates the chord need not be torn apart. In this case, he said, "the use of helper stringers as a temporary repair certainly is preferred handling." He then said that there was a wish to discourage the practice of cutting out crushed or dapped portions in the ends of open-deck stringers, patching these areas and sometimes turning over and reusing the stringers. "This may be a method of adding a few years of life to a stringer," he explained, "but the labor involved makes this a very costly proposition."

Stringers that are split, checked or broken, but otherwise sound, should have the crack closed by jacks and by wedging, and have a drive spike placed, said Mr. Schneider. Where stringers are crushed ⅜ in or more, but are sound beyond the face of the cap, he recommended the application of scabs to the cap.

Speaking of caps, Mr. Schneider said that some types of repairs, like bolting splits and checks, and sealing up splits, checks and ring separations with a sealing or plastic compound at exposed ends in the early stages, will pay big dividends. He said that, by means of scabs, many caps could be

saved if the scabs are applied in the early stages of crushing or when the caps are breathing.

Piling with extensive splits or checks can also be saved, according to Mr. Schneider, if repaired in the early stages by first sealing the cracks with sealing or plastic compound and then closing them up by bolting.

In closing his remarks on this phase of the discussion Mr. Schneider placed emphasis on this point: "Although we think all of the repairs discussed are important, we caution you to keep in mind the remaining life of the structure in deciding on the extent of the repairs. If the bridge is a candidate for renewal in the next five years, make only such repairs to keep in a safe condition. If the bridge has more than five years of remaining life, more expensive repairs can be justified, but even then the remaining life of the structure must be considered."

During the group discussions there was general agreement on most of the recommendations on repair procedure made by Mr. Schneider. However, some objection was expressed to the practice of placing galvanized metal over the chords when the remaining life of the chords was judged to be at least 10 years. Most of the opposition was centered around the rusting out of the galvanized metal under the ties, which lets in the water. Other objections voiced included the fact that the metal prevents inspection and restricts air circulation, and that the relatively short life of it did not warrant the cost. Those who favored the galvanized metal cited its fireproofing value and its protection against the sun in hot climates.

Next on the program was a discussion of renewal vs. repairs by W. R. Wilson, assistant engineer. His presentation dealt first with a review of the accounting rules of the Interstate Commerce Commission as they apply to bridge repair and renewal. He then listed these five points to be considered in determining what type of work should be done:

(1) *Safety*: "Our basic aim is to keep our bridges safe and in operating condition at all times."

(2) *Utilize life*: "We want to get as much use out of all parts of our bridges as possible."

(3) *Economy of repairing*: A timber bridge reaches a stage where it is more expensive to repair than to renew. It has been found roughly, said Mr. Wilson in explaining this point, that if the cost to repair for more than 5 years life is about 20 per cent of the cost to renew, it is usually more economical to renew.

(4) *Renewing with another type*: Where drainage or other conditions will permit, an investigation should be made of the relative economy of other types of structures, such as a reinforced concrete box or a corrugated metal pipe.

(5) *Renewal in kind*: "We should consider that any bridge which has an estimated life up to 5 years is a candidate for renewal and should be so considered."

THIS GROUP attended second session. First group met Feb. 2, 3; second, Feb. 5, 6.

Programming B&B work

Following Mr. Wilson on the conference program, the subject of work programming was discussed by W. R. Hyma, assistant engineer. His remarks consisted, in substance, of a series of recommendations for improved planning and control of B&B work. These recommendations were in the form of a five-point plan, which may be summarized as follows:

(1) Assign a priority rating to all work recommended in the Annual Division Inspection Report. "This will give us a realistic picture of our maintenance needs which is the fundamental necessity in developing future plans."

(2) Prepare a detailed estimate of material costs and labor time in manhours for each job. "In this way our needs are translated into money and manpower, which are the terms that our management must deal with."

(3) Submit for approval a list of required work, showing its urgency and its cost in money and manpower. "In this way, management is given the information required for an intelligent allocation of funds and forces aimed at a satisfactory and uniform level of maintenance."

(4) From this approved list of

Discussion leaders

W. R. WILSON, assistant engineer, discussed ICC rules, and listed points for determining type of work.

F. E. SCHNEIDER, assistant engineer, talked about the inspection and repair of timber trestles.

W. R. HYMA, also assistant engineer, discussed programming, gang organization and mechanization.

Santa Fe B&B conference (cont'd)

work prepare a complete annual schedule for each gang showing what it has to do and when it is to do it. "This is the culmination of the preceding steps and the means by which we gain our increase in efficiency."

(5) Set up a system of weekly reports on progress for comparison with the schedule, and require that the standard time and material distribution reports be made up to provide the data for making a check of the performances.

In the group discussions many points were raised regarding the recommendations on programming made by Mr. Hyma. One of these was to the effect that it would be impossible to stay on a schedule because of emergency work, special requests, errors in estimating, etc. It was agreed that all of these difficulties would arise, but it was pointed out that they were actually arguments for programming instead of against it. It was further noted that the important thing to remember is that any program or schedule must be kept flexible enough to take care of the interruptions that occur.

Gang organization

The organization of gangs, which was the next item on the program, was also handled by Mr. Hyma. At the outset he defined the scope of this subject by explaining that it referred, first, to the make-up of the gang in regard to the number of men and their classification as carpenters, helpers, etc., and, second, to the assignment of the gang in regard to the territory it covers and the type of work it performs.

Taking up the subject of gang size, Mr. Hyma analyzed the relative advantages of gangs of 8 to 10 men and those of 6 men. All the arguments in favor of gangs of both sizes have merit, he said, and either might be applicable, depending on the particular circumstances. "However, small well-equipped gangs," he said, "seem to be the most logical choice since they provide better coverage of the large territories and more flexibility in assignment."

In discussing the second phase of organization—the assignment of gangs by territory and type of work—Mr. Hyma raised the question whether the advantages of specialization outweigh the disadvantages? The advantages, he said, include these:

(A) The men can become more proficient in the narrower field.

(B) More specialized equipment can be justified.

(C) Duplication of equipment can be avoided.

On the other hand these disadvantages were listed:

(A) Loss of division control.

(B) Less flexibility because only the one type of work can be done.

(C) Greater fluctuation of forces because the amount of work in any class will vary, and because it is harder to attract and keep good men on a system basis.

"In considering these points," Mr. Hyma concluded, "we feel that the best answer, in most cases, for B&B maintenance needs, is the general purpose gangs operating on a divisional basis, such as we now have on the Santa Fe."

In the group discussions of organization it was generally agreed that the general-purpose gangs operating on a divisional basis were preferable. However, as to gang size, the majority felt that a 6-man gang was too small, and favored gangs of 8 to 10 men. It was agreed that the larger gangs of 8 to 10 men could be split up whenever the work permitted, with two or three men handling a lot of the light repair work in the vicinity of the main job.

Equipment discussion

In the final major presentation at the conference Mr. Hyma made a comprehensive analysis of the equipment need for B&B gangs. Noting that most B&B gangs on the Santa Fe are quite well supplied with the basic power tools, he then discussed the relative merits of pneumatic and electric tools. Aside from the question of what type of power to use, Mr. Hyma said the "major problem in regard to our basic power equipment is to make sure that we are using and taking full advantage of what we have."

As the final feature of the conference Mr. Sandberg summarized the high points developed and closed with these words: "Finally, I want to say what a wonderful group you have been and how much we appreciate your contributions. Your interest in your work and your loyalty to your company is unsurpassed in any industry. The Santa Fe can truly be proud of a group like this."

Are section f

Says there's no adequate substitute

By **R. G. Simmons**
General Roadmaster
Milwaukee Road
Chicago

• There are 300,000 miles of railroad in this country. In the beginning there were 75,000 track sections. Today sections have been lengthened or abolished on some roads, or parts of some roads, until there are less than half that number.

We might ask "How did we get this organization that has stayed with us for so many years?"

I am told that in addition to building many of the early railroads with mules and scrappers, much of the work was done under individual contract. In other words, individuals were awarded a contract to build a 100-ft section of grade with a pick and shovel and a wheelbarrow. When he had this section constructed he would move on down the line and be assigned another section of grade.

After the grade was built the new track was laid, ballasted and made ready for trains. It was soon discovered that someone had to take care of loose bolts, low joints and many daily track problems. So it was only natural to assign a given piece of track to a foreman and a number of laborers.

In those days, the means of travel were limited to walking. So the sections that were set up were very short and many in number. It wasn't long, however, until the hand car was perfected. Later, the motor car was de-

forces necessary?

The question posed by the title above has been tossed back and forth for years.

At a recent meeting of the Maintenance of Way Club of Chicago the subject was discussed by two speakers.

R. G. Simmons, general roadmaster of the Milwaukee Road, spoke in favor of retaining section gangs.

C. F. Parvin, engineer maintenance of way and structures, Pennsylvania, described a new M/W set-up on that road, which eliminates main-line sections.

Here's what they said:

signed. It was improved until it has become the means by which longer lengths of track can be traveled in shorter periods of time.

Have various duties

However, speeds and sizes of trains increased. Also, many other modern-day complications developed. All added up to many various duties or chores, as some prefer to call them, for today's section forces to handle.

A few of these outstanding items are raising low joints, repairing worn joints, gaging short spots, shimming track, changing broken rails, repairing right of way fences, maintaining rail lubricators, attending switch lamps, checking gage and level, and checking slides and general roadway conditions, including emergency work.

About three years ago I had a conversation with an officer of one of our large railroads about the length of a repair rail that could be put in the main track. His thinking was that a track patrolman and one laborer could cut in an 8 to 10-ft piece of rail if they found a broken rail in a joint. At some later date a larger gang would come along and make a permanent job of it. Of course, if they had more than one broken rail to fix in one day, they likely wouldn't be able to patrol their territory that day.

We on our railroad recently had one of our best passenger trains strike an automobile. The car was carried down the track and wedged in a bridge when the train came to a stop. Fortunately this was a double-track railroad so that the train backed up to the first crossover, then proceeded on the other track. The sectionmen were working within two miles of the scene of the accident and they were called to remove the auto. They did so promptly. But, if we had sections of 50 miles or longer, the railroad might have been tied up for a long time.

I realize that there are locations on all of our railroads where we have branch lines that are only 40 to 60 miles long, or where the traffic is light. At such locations district or truck gangs can be employed to good advantage without section gangs.

Must consider location

When we talk of abolishing section forces I think it is important that we consider the location. On many of our railroads we are confronted with heavy snow over long periods of time. But, when the highways become blocked, we usually can travel by motor car and place our section forces right where the work is to be done.

I recently made a trip out through the Northwest, including the mountains. We all know that there are miles and miles of railroad on many of our mountainous lines where there are no parallel highways. I think this is one of the biggest arguments against the elimination of sections on an out-of-face basis. If you have an organization which travels by truck or if the territory is too long, too much time is consumed in getting the men to the place to work.

I believe we must all agree that much benefit is realized by having sectionmen travel over the track where they can see any defects and all changes that might take place. This cannot be done when running up and down some highway. I also believe that, when the track forces travel by truck on the highway, the track farthest from the highway crossing is the track that will receive the least work.

Another very important consideration is rainfall. In areas of the country subject to heavy rainfall, the highways and bridges frequently are washed out and the railroads are not. In such cases movement of district truck gangs would be limited, whereas section gangs can go by motor car to where they are needed.

I think that another very good argument for section gangs is the inspection of passing trains. With section gangs, moving trains are inspected by more people at more frequent intervals. On our railroad we have a rule that specifies that section forces shall inspect both sides of a passing train wherever possible. We feel that we realize much benefit from this practice every day.

Through the years the position of section foreman has carried a great deal of honor on most of our railroads. The men that have worked up to section foreman have had a pride in carrying out their duties.

Foremen know their sections

All sections are different right down to each individual rail length of track. Most section foremen study their territories, and they know all the spots that require extra attention. In addition to knowing their track, they study and educate their men. This is all reflected in the type of work they do. I recently heard a passing remark that, on some railroads the sections had been lengthened so long, it was necessary to pay the section foreman's expenses before he got over his territory.

Our good friends, the manufacturers of track machinery, have designed and built us the machinery necessary so that today the average section gang can be 100 per cent mechanized, from rail drills to light portable tampers. By the right selection of equipment, it is not difficult to increase the man-hour output.

I am sure that, in many instances where sections have been abolished, an organization has been set up to cover a given length of track in a given length of time. However, due to weather, emergencies, or finances available, this new force is unable to cover the

What the PRR is doing

Are section forces necessary? (cont'd)

territory and do the work in the time alloted. Hence the track is not in as good a condition as it might be. The lack of finances is likely to be the greatest factor involved in this deficiency.

It has not been my intention to leave the impression that, because we have had section forces since the beginning of the railroads, we must have section forces from now on. However, it is my honest opinion that as adequate substitute has not yet been conceived to replace our sections forces and get the job done.

No section gangs under this plan

By **C. F. Parvin**
Engineer maintenance of way and structures
Pennsylvania
Philadelphia, Pa.

• The importance of mechanizing our maintenance-of-way forces has been well recognized during recent years. As a result of extensive purchases of maintenance-of-way machinery in the seven-year period 1952 to 1958, we raised and surfaced 30 per cent more track in 1958 than in 1952 with 50 per cent less force.

During June 1957, the Pennsylvania established our present cycle-maintenance program. It was put in on our main line between Rochester, Pa., 34 miles west of Pittsburgh, and Chicago, a distance of 433 miles. This program did not require section gangs and 52 existing main-line section gangs were abolished. The results were so satisfactory that in 1958 the program of cycle-maintenance was extended east to the Philadelphia Terminal area, an additional 363 miles. Also in 1958, a similar program was started on the 611 miles of line between Pittsburgh and St. Louis. This program will be completed by May 1. The above mileage adds to 1,407 miles of line. The only exceptions are the passenger terminals in Harrisburg, Altoona and Pittsburgh. At these locations, we have section gangs.

Prior to this, in 1955, our chief engineer appointed a committee to study the many machines available for making tie renewals and the new and improved models of tamping machines. As a result of this 1955 study, additional equipment was ordered so that in 1956 a large part of our system main-track tie renewals was made by the mechanized gangs.

During 1956, further studies were made as to what could be accomplished and what savings could be made by further mechanization. First consideration was given to additional on-track mechanical tampers and associated equipment required for surface raising and lining between tie renewals and placing this item of track work on a cycle basis. It was decided to put tie renewals on a six-year cycle with an intermediate surface raise every two or three years, depending on traffic and rail conditions.

When raising in conjunction with tie renewals and surfacing, with both being on a production basis, a work train was needed ahead of each gang. In addition, a gang to repair and renew road crossings was needed to work with each gang.

The men needed for the additional work-train and road-crossing gangs, and to use the additional equipment purchased, had to come from existing forces. From this developed the plan to abolish the section gangs and still accomplish all the work formerly done by them.

It was evident that certain items of work could not be very well performed by gangs. These items were:

1. Spot welding of rail ends and engine burns.
2. Grinding of frogs, switch points, stock rails and welds.
3. Changing broken rails.
4. Cleaning ditches and culverts after storms.
5. Renewing worn out material in insulated joints.
6. Tamping of low joints off end of road crossings, insulated joints, chipped out joints, etc.
7. Delivering material, picking up small scrap, etc.
8. Track patrolling.

Retains certain positions

To take care of the above work, the following positions were to be left under the immediate jurisdiction of the supervisor. They would perform duties as indicated:

Foreman-Track—Patrol track by track car, supervise and keep time for other subdivision men. For some time our railroad has been using one man to patrol a supervisor's territory by track car. This patrol territory is about 45 to 50 miles. With the change to cycle maintenance, the job was up-graded from an assistant-foreman's job to that of foreman. The foreman is then responsible for making necessary frog and switch inspection and other inspections and reports formerly made by the section foreman.

Welder—Perform necessary welding and help as required on emergency jobs.

Machine Operator—Operate grinding machines, power drill and small compressor furnished each sub-division.

Chauffeur—Deliver material and keep small scrap picked up. Also drive truck in case of broken rails and other emergencies.

Engineer Work Equipment—Operate cranes. These positions applied only to where supervisors had an assigned crane.

Trackman—Two to four to each supervisor.

To enable the foreman to take care of broken rails with the machine operator, chauffeur and one or two trackmen as a gang, the following set up was made. A truck with hydraulic tail-gate was furnished to each supervisor. Each truck carried a rail saw and a rail drill. Rails of various sections in 14-ft lengths were available at headquarters of the sub-division. A 14-ft section is cut from the broken rail adjacent to the break and a 14-ft piece of emergency rail is put in track.

Also on the truck is a small 36-cfm air compressor. This is used with one tamping gun to tamp the low joints at road crossings, insulated joints, etc., referred to previously.

To do programmed work, other than raising track and installing ties, district "skirmish" gangs were organized. These gangs renew switch ties, clean ballast and raise tracks at interlockings, renew joint bars, work tracks through towns where road crossings were so close together it would be im-

practical to use the mechanized gangs, and do other work formerly done by sub-division extra gangs.

In June 1957, section gangs were abolished in the territory west of Pittsburgh to Chicago, as previously outlined, and the set-up on the Fort Wayne district, which was typical of other districts, was as follows:

One heavy-maintenance gang
Two raising gangs
Three spot-surfacing gangs
Two work-train gangs
Two road-crossing gangs
Three skirmish gangs

In addition to this, there were the seven or eight men assigned directly to each supervisor as outlined previously.

A skirmish gang was programmed to work on a supervisor's territory at a time he had neither of the mechanized raising gangs.

At this time, I call your attention to the fact that this set-up applied only to main tracks. Where a supervisor had yard or branch lines on his territory, no change was made at this time in the force already set up on such yards and branches. In a few cases where a section gang had both main-line tracks and yard tracks, a small yard gang was created from existing forces in order that the main-track work could be entirely separated from yard and branch-line work.

Plan is successful

The results for the first season were very satisfactory. With the completion of the summer's programmed track work, the district gangs were assigned in such a manner that each supervisor had at least one gang on his territory during the winter. This gang was available for snow and other emergencies. Also a regular program of work was carried on during the winter season. This included bolt tightening, splice bar renewal, brush cutting with dormant spraying, etc.

Generally, the heavy-maintenance gang was divided into two smaller gangs for the purpose of doing programmed winter work.

As a result of the work done in 1957, this method of maintenance was expanded last year to cover the additional mileage that now totals 1,407 miles of road. The results of a little over two years of this program have resulted in a much more uniform ride over the railroad, and the ride is better than it has been for the past several years. Where rail conditions are good, we have found the period between surface raises can be extended beyond the two-year cycle. Cycles on branch and in yards are established in accordance with the importance of the track.

So far I have explained why we went to a maintenance-of-way organization that led to the abolishment of section gangs.

However, it is important to say that economies have been realized.

The use of machinery and better use of the track now permits us to raise more track and install more ties in a day with 40 or less men than we formerly did with 140 men. As for raising track without ties, our gangs are raising as much as 7,000 ft a day with nine men. Of these nine men, one is a gang watchman and one man is a telephone man. The telephone man is now being released through the use of mobile telephones.

Cost of other work reduced

Other work performed by track forces is also being done at a lower cost per unit. By January 1, 1957, our company had installed a data-processing machine method of keeping payrolls and time distribution. Since then we have had excellent statements showing unit cost for labor of doing the various items of work. One such statement shows description of work, units of work, quantities of work done in 1958 and 1957, man-hours per unit of work for both 1958 and 1957 and man-hour savings based on 1958 quantities. The items are:

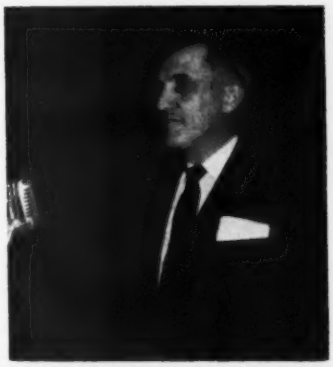
Raise track—no ties
Raise track—with ties
Spot surface
Unload ballast
Dig in cross ties
Renew switch ties
Unload ties—work train
Renew rail
Unload rail with work train
Load rail with work train
Renew splices
Tighten bolts
Weld rail ends
Weld engine burns
Cross-grind rail ends
Inspect track
Clean and fill switch lamps

There was a reduction in man-hours per unit for all the major items of raising track, with and without ties, and spot surfacing. There was a reduction in all but seven of the remaining items. The man-hour savings, based on 1958 quantities, was 999,003 man-hours. With the average rate being over $2.00 for each man-hour, the saving amounts to over $2 million.

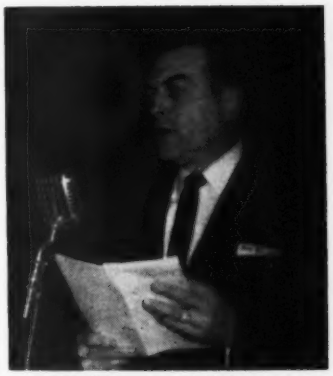
As to the future, we will continue to expand this type of maintenance as money for more machinery is made available. We anticipate doing yard and branch maintenance with such a cycle-maintenance program. The exception will probably be our passenger terminals. Such a program is now in effect on several branch lines and in our new Conway Yard.

While we continually try to improve our method of working track, our attention is now focused on those jobs other than programmed track work which our maintenance gangs perform. Programmed track work takes 30 per cent of our track force money, the "other work" takes 70 per cent. Now our job is to reduce not only this percentage but also the total track-force money spent on such work.

The speakers



R. G. SIMMONS — "I think that another very good argument for section gangs is the inspection of passing trains."



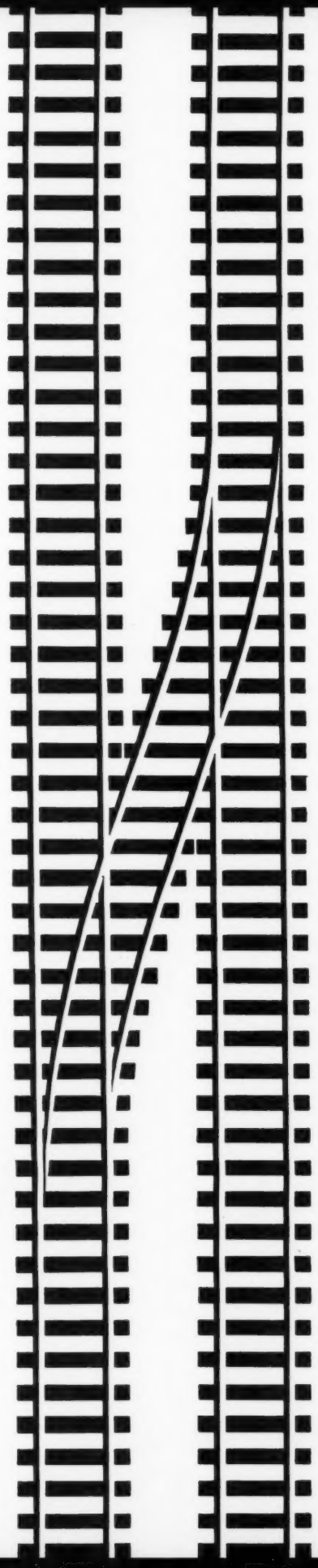
C. F. PARVIN—"... A little over two years of this program have resulted in a much more uniform ride over the railroad and the ride is better..."

ARTIST'S DRAWING of a new freight warehouse being built at East Los Angeles by the Union Pacific. The structure will have track space for 80 cars. An unusual feature will be the reinforced concrete multiple barrel-shell roof. In addition to the warehouse, the project, to cost $3 million, will include office buildings and an open platform with five-ton monorail hoist.

News briefs in pictures . . .

FIRST TRAINS are expected to roll across the Southern Pacific's new 13-mile causeway (right) across Great Salt Lake in July—roughtly a year ahead of schedule. More than 96 per cent of the 43,500,000 cu yd of fill has now been placed. The laying of track will get under way toward the end of May. This view shows the location of the causeway relative to the existing trestle which it will replace.

NEW LINE being built to carry the Western Pacific around the Oroville Dam reservoir on the Feather river in northern California will be featured by several large and unusual bridges. One of these (above) will consist of deck-plate girder spans on circular, single-shaft concrete piers. The second set of "bob-tailed" piers is being built in event a second track should be required in the future. The view above shows reinforcing steel for an open-spandrel concrete arch with a main span 308 ft long and a height of 200 ft from river bottom to base of rail. This is claimed to be the largest railroad structure of its type.



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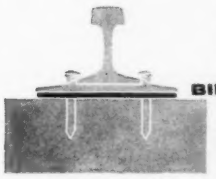
. . . to Bird Self-Sealing Tie Pads to extend average tie life at least 50%. Bird Tie Pads save over $1000 per mile per year — on main line tangents as well as on switches, curves, crossing frogs, highway grade crossings and other critical areas. For proof positive, write for booklet to Department HTS.



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On line after line, maintenance-of-way crews are being modernized with the new Rail-Road Conversion Unit. Mounted on automobile or light truck for fast, economical travel on track or highway, the Rail-Road is ideal for inspection trips or for hauling men, materials and tools right to the job. It is available (1) already installed on new automobile or light truck of your choice . . . (2) as a "kit" for installation on your equipment in your shops . . . (3) installed on your vehicle in our shops. Now available with steel or rubber wheel tread.

The Rail-Road is easily installed on almost any make of sedan, station wagon, pickup, panel or truck up to 1 ton rating. The assembly retracts and locks underneath the vehicle, with exceptional clearance for highway travel. The simple hand-lever operation is foolproof and maintenance-free. It takes one man less than a minute for on-track positioning or for removing from track.

The low initial cost of the Rail-Road Conversion Unit spreads over years of service. And the Unit is re-usable on other vehicles with slight mounting modifications at time of change-over. Attractive leasing terms are available if desired.

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This FORWARD-CONTROL Jeep equipped with the Rail-Road Unit is ideal for many track-maintenance uses. Consider these important features:

4-WHEEL DRIVE — vehicle can be taken off or put on track in almost any location. Choose from 9 forward speeds for best traction.

SHORT WHEELBASE (Only 81") — increases maneuverability and ease of operation through frogs, switches, etc.

HEAVY-DUTY CONSTRUCTION — built into both Jeep and Rail-Road Unit. Insures long, trouble-free performance. Carries up to 2200# payload.

FULL VISION — "Eyes-up-front" position of cab (NO HOOD) permits track inspection 6' ahead of vehicle. Wrap-around glass gives maximum vision in all directions.

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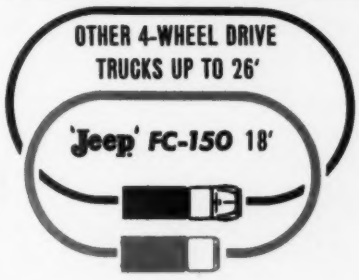

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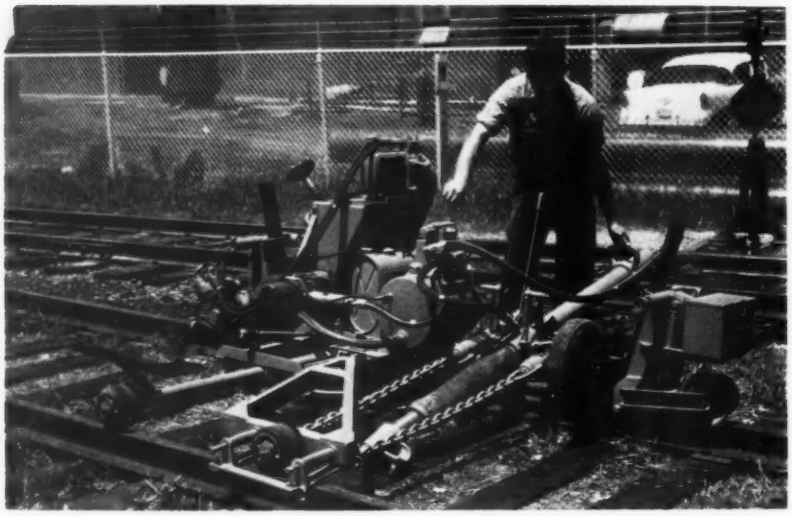
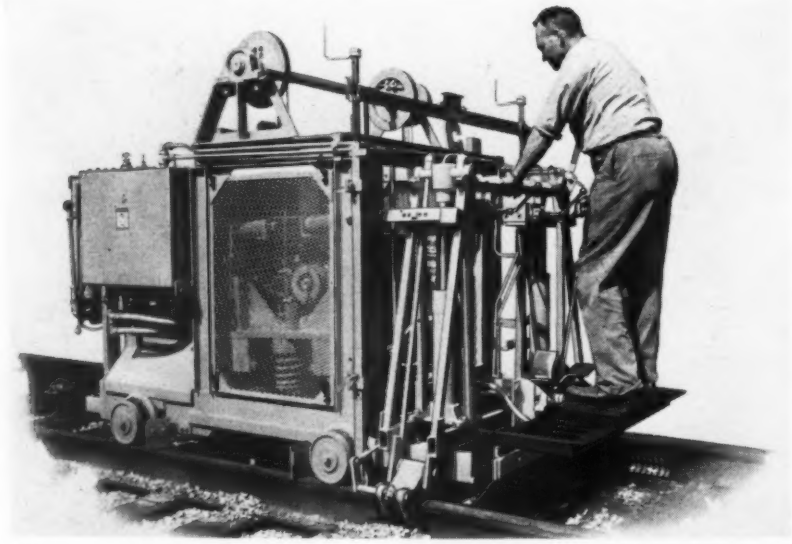


Three attachments for . . .

Tie Remover

INCREASED PRODUCTION is claimed to result from the use of three new attachments on the Fairmont W68 Tie Remover. One is a self-propulsion unit, designed to speed its travel along the track. Another consists of automatic rail hooks which are said to convert the unit into a one-man machine. The third attachment is a hydraulically driven tooth grinder which is said to make it possible for one man to sharpen the shoe teeth while they are mounted in place. *Fairmont Railway Motors, Inc., Dept. RTS, Fairmont, Minn.*



Improvements made to . . .

Tamping power jack

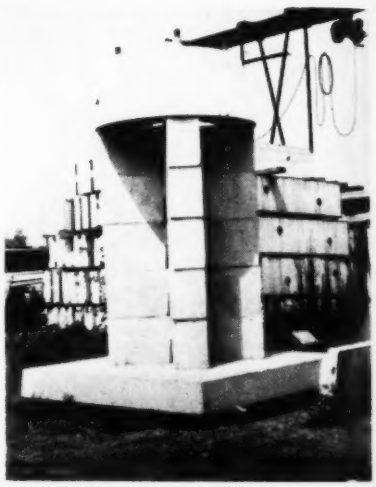
FOUR MAJOR improvements are said to have been made to the new Nordberg Model C Tamping Power Jack. One is the incorporation of a new mechanism, called the Double Vibrator, which is claimed to speed penetration through the crib ballast. It employs two counter-rotating eccentric weights that are claimed to increase the impact and vertical vibration of the tamping head and bars while eliminating horizontal vibration and reducing machine vibration. The latter, according to the manufacturer, has the result of making the cross-level bubble and pointers more stable when the machine is teamed with a Nordberg Trak-Surfacer.

Another is a new tamping bar back-up-spring arrangement which is said to make it easier to keep the tamping bars in proper position.

A third improvement is a new two-piece tamping bar design which is stated to permit quick and easy change of tamping bar ends to those best suited for high lift, low lift or smoothing.

Finally, the transmission and brake essembly are claimed to have been simplified to provide more positive braking, easier adjustment and more uniform propulsion in both directions.

The manufacturer states that each of these improvements is available for installation on previous models. *Nordberg Manufacturing Company, Dept. RTS, Milwaukee, Wis.*



Precast sections for . . .

Signal foundations

THE LARGEST precast concrete sectional foundation yet produced by them has been announced by the Permacrete Products Corporation. It is stated that the new foundation is being used for bracket post signals and under the individual legs of 3, 4, 5 and 6-track signal bridges. The foundation is designed so that 85 per cent of the area of the large heavily-reinforced base is exposed for vertical earth loading to resist overturning. The manufacturer claims that the required soil bearing pressure is about one-half that required for monolithic or field-poured foundations. The 1½-in diameter galvanized bolts are screwed into plates which are cast into the base section. The bolt anchorage is unexposed. The base weighs 2200 lb, each column section is 12 in high and weighs 350 lb and the top section is 17 in high and weighs 1200 lb. The foundation may be assembled and bolted together at the factory and placed with a crane or furnished unassembled and installed without a crane. *Permacrete Products Corporation, Dept. RTS, 1839 South Wall St., Columbus 7, Ohio.*

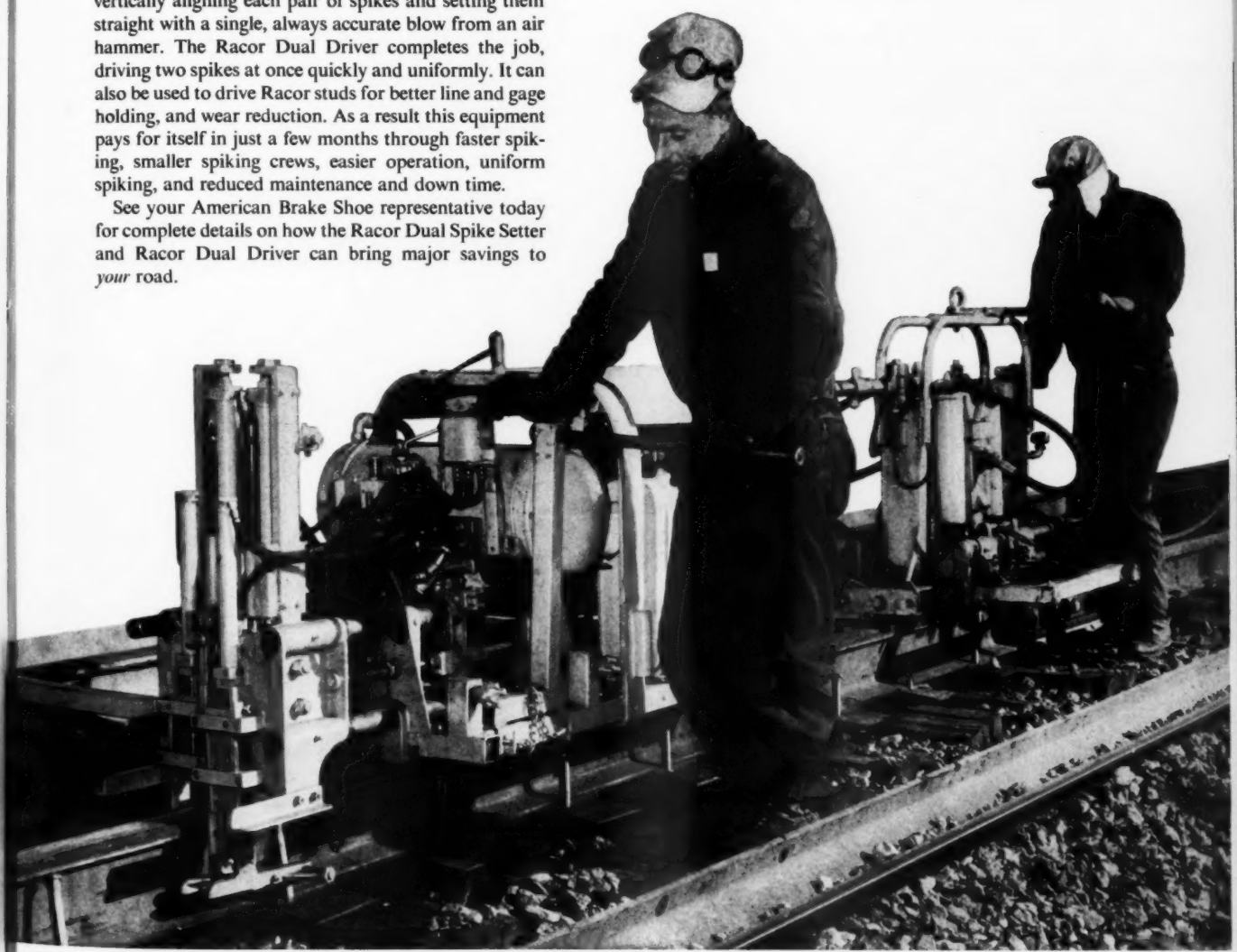
Spikes set up straight and true by the Racor Dual Spike Setter are firmly, quickly driven by this Racor Dual Driver.

This Racor Spiking Team can do the work of a dozen men

RACOR DUAL SPIKE SETTER AND RACOR DUAL DRIVER CUT COSTS, SPEED RAIL LAYING, AND IMPROVE TRACK

Once, as many as twenty-one men were required to set and drive spikes. Now nine can do the job better and faster than ever before with the new Racor Dual Spike Setter and Racor Dual Driver doing the work of twelve men. Just one or two men are required to position spikes ahead of the Racor Dual Spike Setter which moves in, vertically aligning each pair of spikes and setting them straight with a single, always accurate blow from an air hammer. The Racor Dual Driver completes the job, driving two spikes at once quickly and uniformly. It can also be used to drive Racor studs for better line and gage holding, and wear reduction. As a result this equipment pays for itself in just a few months through faster spiking, smaller spiking crews, easier operation, uniform spiking, and reduced maintenance and down time.

See your American Brake Shoe representative today for complete details on how the Racor Dual Spike Setter and Racor Dual Driver can bring major savings to *your* road.



A-2994

AMERICAN Brake Shoe COMPANY

RAILROAD PRODUCTS DIVISION
530 Fifth Avenue, New York 36, N. Y.
In Canada: Dominion Brake Shoe Company, Ltd.

What's the answer?

To be answered in August

Do you have an answer to any of the questions listed below? If so, send it in. Payment—based upon substance and length—will be made for each published answer. If you'd prefer that your name be withheld, we'll gladly comply.

DEADLINE: June 30

1. Is the application of rail anchors justified for use on dirt-ballasted branch lines where the ties are working back and forth? Explain.

2. When not being used for painting, what other railway applications can be made of truck-mounted aerial booms? Describe how employed.

3. Since termites may have interior passageways to their source of moisture, how can it be determined whether or not a pile is infested? Explain.

4. Where interstate highways closely parallel railway tracks, how frequently and in what form should access be provided to the railroad right of way? Why?

5. Should fire extinguishers be carried on work-equipment units? Which units? What types of fire extinguishers?

Send answers to:

What's the Answer Editor
Railway Track & Structures
79 West Monroe Street
Chicago 3, Illinois

Do you have a question you'd like to have answered in these columns? If so, please send it in.

Where to use welded switch points

Should switch points that have been repaired by welding be used in main track? If so, can welded carbon-steel points be used, or should this be confined to manganese-steel tips only? Why?

Not closed point

By A. B. CHANEY
Engineer Maintenance of Way
Missouri Pacific Lines
St. Louis, Mo.

On primary main tracks, we do not repair the closed points of facing turnouts by welding. We do permit such repairs on the open points. Except in emergencies or when replacements are not readily available, we do not repair manganese tips by welding methods but prefer to replace such tips with new ones.

Carbon-steel switch points can satisfactorily be repaired by welding for use on light-traffic lines and for inside tracks. We do permit experienced and fully qualified welders to make repairs to manganese and carbon-steel points in primary main tracks in preference to taking a turnout out of service if the replacement parts are not available.

Not in main track

By TROY WEST
Engineer of Track
Union
East Pittsburgh, Pa.

To deal properly with this subject the entire turnout should be considered. The switch points take more wear in comparison with other component parts of a turnout, and it is reasonable to expect, under ordinary circumstances, that replacement will be required more often. However, by making a good installation of a well-constructed turnout, and with proper subsequent maintenance, I believe the switch points can be made to last out the service life of the entire unit. A switch point that has been repaired by welding should not, in my opinion, be used in main track, because the safety factor is reduced, and it can be more expensive in the long run. The following is offered in support of this statement.

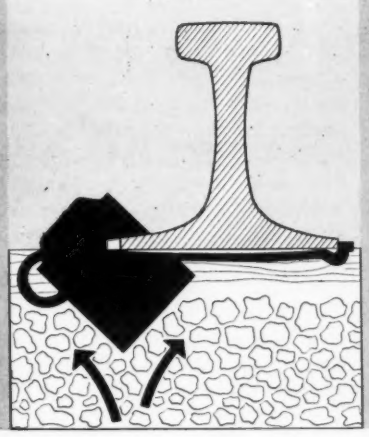
Consider the location of the turnout in the main track, whether in automatic-block or CTC-territory, one or two-way traffic, speeds, axle loading and the tonnage handled. All of these have a bearing on the design installation and maintenance of the turnout. When 15 or 20 million tons of traffic are handled yearly, the economical weight of rail could range between a minimum of 115 lb and a maximum of 132 lb, depending further on alignment and grades.

The design of the turnout should conform with the latest AREA specifications for such duty as required. Three gage plates should be used, placing one in front of the switch point and the other on adjacent ties at and next to the actual point. The bend in the stock rail should conform with the planed angle of the switch point so that proper fitting can be maintained. This is important since in making the vertex of the bend in the stock rail to properly seat the point, the wear is reduced at the point of the thinnest metal. Switch points and matched stock rails that are produced by the manufacturer for neat seating by undercutting and sloping of the rail provides a unit for long service life and safe use. However, where this requirement is not used and the stocking and fitting of the points is made in the field by company forces, the lack of care or precision in the installation can impose unnecessary wear and a maintenance problem on the switch point. In my opinion the switch point should be heat treated, even though the purchase cost may be increased by 75 per cent, because the service life can be more than doubled over those not heat treated.

The bridle rods should provide for both lateral and vertical stability of

Welded Rail Needs Bulldog Rail Anchors

HOLDING POWER is the reason. No other rail anchor provides as much *immediate* and *sustained* holding power as a BULLDOG. That's because *only* BULLDOG is made with two factory-assembled parts that provide a two-way grip . . . with each part multiplying the holding power of the other.



BULLDOG ANCHORS keep their grip. Because sustained holding power is vital in anchoring welded rail, you need the unyielding grip of BULLDOG. Even frozen ballast can't break this grip because the point of the clamp pushes the ballast to either side.

AND BULLDOGS save you money. The deep, flat tie-bearing surface protects ties, won't disturb spike because it doesn't contact tie plate. Easy driving saves time. Can be reapplied with no loss of holding power. And BULLDOGS are easy to ship, easy to handle . . . cost no more.

TO SUMMARIZE . . . Welded rail *demands* the sustained grip of BULLDOG anchors. You just can't afford to skimp on holding power. You get the savings of safe re-use . . . tie protection . . . easy, fast application. And you don't pay a penny more for BULLDOG advantages. Your True Temper representative has all the facts. Or you can write True Temper, Railway Appliances Division, 1623 Euclid Avenue, Cleveland 15, Ohio.

OTHER TRUE TEMPER RAILWAY PRODUCTS: Track Shovels • Ballast Forks • Weed Cutters • Hammers • Sledges • Scythes • Safety Rail Forks.

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BULLDOG RAIL ANCHORS

YOU CAN LOOK TO TT FOR LEADERSHIP

the switch points, which can be accomplished by a vertical-type rod with serrated adjustments and socket connections. This provides for small increment adjustments in the rods. This is important, since the three gage plates and the rods can be installed in unison for the designed gage, without placing undue strain on any component part.

The heel of the switch point should be supported by the proper spacing of ties and the use of designed plates. The heel block should be through bolted to the stock rail because a better fitting point can be maintained.

Assuming that the above precautions have been observed in the design and installation of a main-track turnout, the subsequent maintenance of the switch points can be provided for by keeping all movable parts lubricated and fitted. Displaced metal on the stock rail caused by wear should be removed to prevent chipping of the switch point. When this is done, I believe that the points will last as long as the other parts of the turnout, and the problem of installing a used switch point will have been solved.

Safety in truck transportation

What safety precautions should be taken when transporting men in trucks? When transporting tools and equipment? Explain.

Don't overload

By R. A. NEWTON
Supervisor of Safety
Chicago & Western Indiana-Belt
Chicago, Ill.

The precautions that should be taken when hauling men in trucks:

If men are to be hauled regularly by truck, a special body with a "crew cab" will provide the greatest amount of safety and comfort. Such an arrangement can provide a seating capacity for eight men in addition to the driver.

When men are to be transported in a truck primarily designed for material handling, grab irons and steps should be provided to facilitate getting on or off. The men must be seated and the benches used must be secured. Men should never be permitted to sit on loose kegs or boxes or to stand. Material or too's hauled along with the men must be placed forward and secured to eliminate the possibility of injury from same due to sudden stops.

A cover should be provided for protection against the cold or rainy weather. On C&WI, tarpaulins and hoops were replaced with detachable aluminum tops which provide more protection and last longer. On some of our trucks it was necessary to extend the exhaust pipe to keep fumes from entering the truck body.

Precautions when hauling material:

Care must be taken not to overload the truck. Overloading is not only illegal, it overstresses the tires and equipment. Supervisors should issue instructions on the maximum depth of ballast, sand, dirt, etc. and maximum number of tie plates, angle bars, etc. to be hauled. This is important. We have a truck with 200-cu ft hauling capacity and a maximum payload of 6,300 lb. If this truck were to be loaded full with ballast weighing 100 lb per cubic foot, the weight of the load would be 20,000 pounds—13,700 pounds in excess of the maximum.

Objects hauled should be loaded so they will not endanger the driver in case of a sudden stop and also to minimize chance of damage to the material. Long planks, pipes, etc. protruding beyond the truck body should be protected with a red flag.

We have found demountable hoists, which fit into a sleeve welded to the truck body, to be a safe, economical means of loading and unloading heavy materials such as frogs.

Driver is important

By J. T. SHEPHERD
Roadmaster
Norfolk and Western
Buena Vista, Va.

The first and most important precaution to be taken before any highway equipment is used lies in the wise selection of a driver. Whenever possible, the same driver should be used for the same truck. It is not feasible to establish regular positions as truck drivers. However, practically every force has one or more men that would be glad to drive and care for the truck along with their other duties. This man must be selected for his highway safety record as well as for his mechanical and driving ability.

At all times, regardless of what is being transported, strict adherance to all highway rules and safety precautions must be observed.

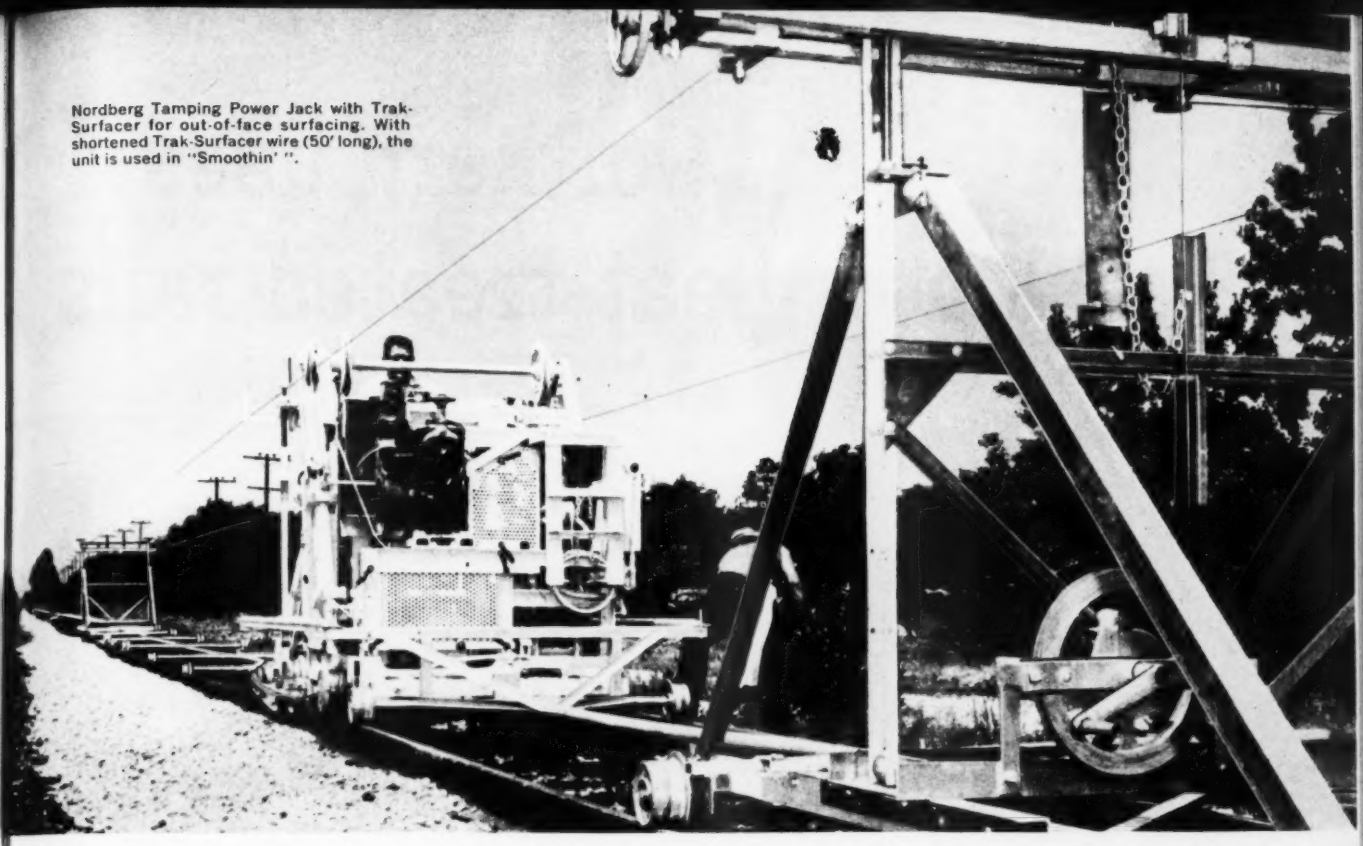
When our highway trucks were received, they contained benches for seating the men and a canvas top over the stake body. Tools were piled beneath the benches. After a few applications of the brakes it became obvious other arrangements must be made. Accordingly the benches were removed and seat boxes were substituted. All small tools are now carried in these boxes with no danger of them becoming dislodged and injuring the men. It goes without saying that the men are frequently cautioned to remain seated while riding and to keep braced as much as possible against an unavoidable lurch.

After considerable study it was deemed advisable to roll the canvas top back one rib from the back. This had a dual result. First, it provided easier escape should conditions require it, and second it eliminated the exhaust nuisance. We had previously tried lengthening the tail pipe on certain makes to keep the exhaust from being sucked into the rear of the truck, with only partial success.

Whenever power tools, such as small compressors, spike pullers, etc., are transported by truck, the gasoline should be drained from the tank. The power tools should be secured by braces, ropes or cables to prevent them from sliding around and being damaged. Whenever such tools are transported by truck, it is inadvisable except in extreme cases to transport men at the same time in the same vehicle. The reasons for this are legion and speak for themselves.

Trucks have proven a great boon, especially with the longer sections and the increase in mechanized maintenance. Too much effort can not be ex-

(Continued on page 50)



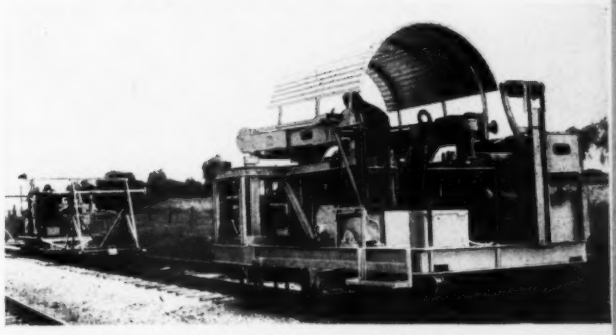
Nordberg Tamping Power Jack with Trak-Surfacer for out-of-face surfacing. With shortened Trak-Surfacer wire (50' long), the unit is used in "Smoothin' ".

ORGANIZED MECHANIZATION... Nordberg Machinery Cuts Cost on Out-of-Face Surfacing Operations

ORGANIZED MECHANIZATION has two vital parts. First, providing the best combination of equipment to do a given job; and second, coordinating that equipment into an efficient working team.

Look at the way Nordberg equipment used in out-of-face surfacing effectively meets these criterions. Like the teamwork of a smooth running backfield, Nordberg equipment moves along leveling and lining the track. The self propelled Tamping Power Jack, main unit of the Trak-Surfacing team, raises track, tamps ties to hold the raise, and provides propulsion power for the Trak-Surfacer. In out-of-face surfacing the Trak-Surfacer uses a stretched wire 125 feet long to form a reference line for the top of the grade rail. Following right after, comes the new and improved 1959 Gang Tamper to tamp ties. Then the Trakliner and Line Indicator come into play to line tangent and curved track. *This mechanized Nordberg team moves along like clockwork.*

Consider the many advantages of such ORGANIZED MECHANIZATION and how it can be applied to save money and speed up *all* track maintenance operations.



The new and improved 1959 Nordberg Gang Tamper tamps by impact and vibration. It is the ideal unit for out-of-face surfacing or Smoothin'.

With the Trakliner as the central unit, the Nordberg Line Indicator does a complete job of lining track. Sighting is done with a 120 ft. length of wire.

NORDBERG MFG. CO., Milwaukee 1, Wisconsin

NORDBERG *Mechanical Muscles*®

Write for LEASING Plans

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R459

Why Great Northern uses Bethlehem heat-treated rails

Back in February, 1951, engineers of the Great Northern selected two curves—No. 20 and No. 22—on its main line near Carlton, Minn., as sites for comparative tests of heat-treated versus untreated rails. The curves were comparable in most respects, including their curvature of 4 degrees.

Track gangs installed 88 Bethlehem heat-treated rails, 115 RE section, on both high- and low-side rails in curve No. 20. Similarly, 88 non-heat-treated, end-hardened rails were laid in Curve No. 22.

Four and one-half years later, after carrying 193,000,000 gross tons of traffic, the original untreated rails on the high-side of Curve No. 22 had to be replaced because of extensive shelling. In fact, at least one of these untreated rails had developed a detailed fracture from the shelling. The remaining rails, including all the heat-treated rails, continued in service.

When these photographs were made in October, 1958, some 316,000,000 gross tons had poured through the test curves. Results were conclusively in favor of the heat-treated rails, as the contour tracings testify. Bethlehem heat-treated rails are now being installed on a number of curves on the system which have been expensive to maintain because of wear.

Perhaps you would be interested in the details of this and other successes being scored by Bethlehem heat-treated rails for a growing number of representative railroads.

One of our engineers is eager to discuss these success stories with you. Just call our nearest district office, or write to the address on the opposite page.

HEAT-TREATED

Curve No. 20, high-side rail. Average wear of 5.0 pct considered typical, with light flaking and head checks evident.

UNTREATED

Curve No. 22, high-side rail. Contour of original rail at top, replacement rail below. Very heavy flaking. Note wear on replacement rail already nearly equals that of treated rail.

HEAT-TREATED

Curve No. 20, low-side rail. Average wear of 3.2 pct considered typical. Practically no crushing or plastic deformation.

UNTREATED

Curve No. 22, low-side rail. Average wear 4.4 pct. Note heavy crushing and deformation of untreated rails in this curve.

BETHLEHEM STEEL

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA. On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. *Export Distributor:* Bethlehem Steel Export Corporation

BETHLEHEM STEEL

What's the answer? (cont'd.)

(Continued from page 46)
pended to provide for safe, fast and efficient transportation of men and equipment to points of work and return.

All men seated

By W. W. CHAFFEE
General Track Supervisor—System
New York, New Haven & Hartford
New Haven, Conn.

Safety precautions which should be taken when transporting men in trucks is dependent on the size of the gang, whether or not tools are to be transported in the same vehicle, and how many and what type of tools.

For a six-man gang the safest transportation would be a second cab for the men, with space remaining for tools. A larger gang, requiring more seating room, could use a canopy truck with a covered box on each side for seats. The size of the box should insure safe seating, and be strong enough to carry the necessary tools. By using a tool box of this type the floor space necessary for safe walking will be retained.

Entrance to a canopy-type truck should be by means of a ladder, which should have step treads approximately at stair angle and a hand post for retaining balance.

Capacity of the truck should not exceed the number of men that would be properly seated. No men should stand or sit on makeshift seats that could topple over.

The transporting of equipment with the men is not recommended. When conditions make it necessary to handle a small piece of equipment with men, it should be placed at the forward end of the truck to prevent the possibility of the equipment coming in contact with the men.

Driving speed should be normal, with no fast starting or stopping that would cause the men to be unbalanced. The drivers should be qualified to handle the vehicle as specified, and pass the necessary rule and regulation examination, as required by the individual railroad.

Inspecting completed buildings

Usually, the railroad designer of a building never inspects the structure after it is once placed in operation. Is this good practice? What procedure should be followed to acquaint the designer with the soundness of his design as well as of the performance of any new materials used? Explain.

Inspect periodically

By A. L. BECKER
Engineer of Structures
Missouri Pacific
St. Louis, Mo.

This question has received my attention many times.

When a project is originating in this office we endeavor to have the men, who will make the final drawings, attend preliminary meetings. They are encouraged to enter into all discussions concerning the proposed work, and, before the plans are started, to visit the site for acquainting themselves with the surroundings.

We have also adopted the policy of encouraging our designers and draftsmen to make periodical field inspections during the course of construction. This practice has proved beneficial to both railroad and personnel. The designer can see first hand where improvements or changes should be made before the work has progressed too far, or perhaps the changes can be incorporated in future work. If those who have made the drawings for a project have a chance to see the building under construction, they are in a much better position to enter into a discussion relative to changes, etc. which are almost sure to arise.

We have also found that, when a designer is permitted to make field inspections, he gains additional knowledge of railroad operation and becomes more interested in his job. Consequently his work improves and he becomes a more valuable asset to his employer.

Make field checks

By J. B. SCHAUB
Engineer of Buildings
Illinois Central
Chicago

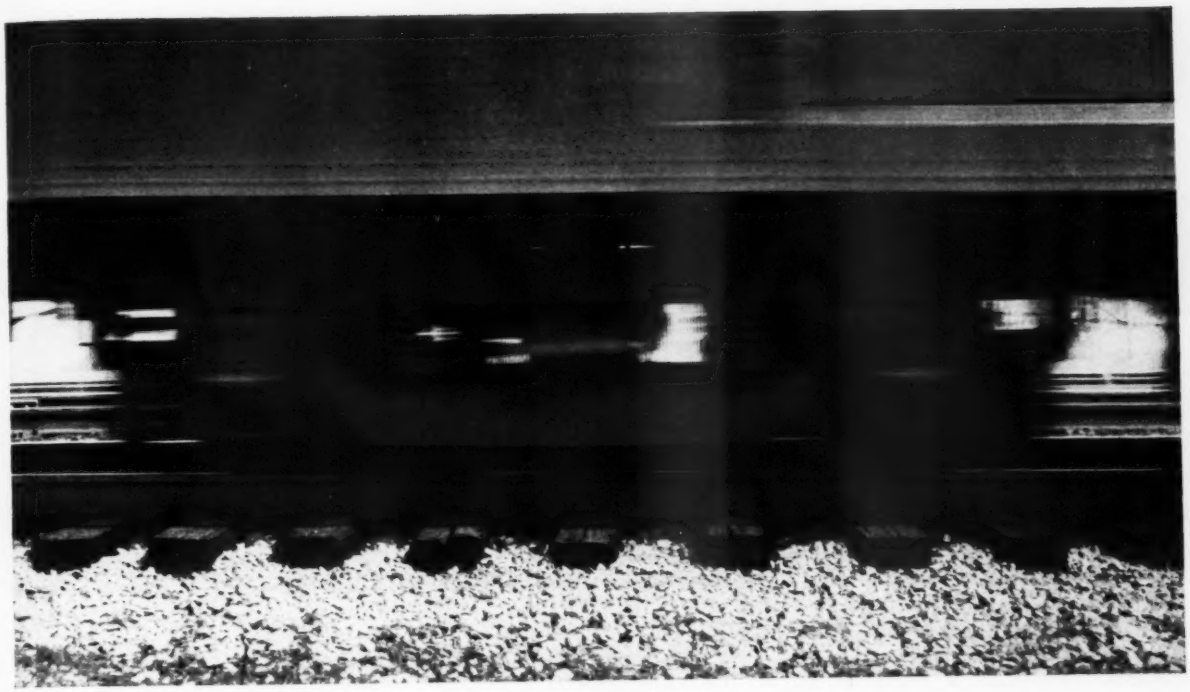
The first sentence of your question is a statement the accuracy of which I am inclined to doubt. It is my belief and observation that many designers of railroad buildings inspect the structures after they are placed in operation. This is the way it should be and provides answer to the first question.

This is an age of specialization. Practically every one is a specialist. This condition has developed rapidly over the past generation. Our progress and standard of living can in a large measure be attributed to that fact. So it is no cause for surprise to find specialists among designers and builders. A good designer or planner is not necessarily a good inspector or superintendent of construction and the reverse may be true. However, the designer of a building most assuredly will profit by seeing the result of his planning after the structure is placed in operation and likely profit even more by seeing the structure at various stages during construction.

It has been the policy of this department for many years to have the designer of a building or structure, whenever possible, see the structure in progress and after being placed in operation. We have found this to be very beneficial. It is also a help to a designer or planner to talk with the people who are using a similar facility and with those who are going to use the new structure. It is frequently found that the department or official who is called upon to pass upon and approve plans is not as conversant with the actual method of operation as the person who is going to make use of the facility.

As to the use of new materials and their performance, it is difficult to give a concise statement. There is a continuous flow of new materials coming on the market. Some are good and some are not. Some are introduced by personal representatives or salesmen, others by mail circulars,

They are crossing this right-of-way with a utility line, but it's TRAFFIC AS USUAL on the track



.....THANKS TO SAFE, FAST, EFFICIENT TUNNELING WITH ARMCO LINER PLATES. TUNNELING SAVES THE SURFACE. SEND COUPON FOR DETAILS.

ARMCO DRAINAGE & METAL PRODUCTS, INC.
6599 Curtis Street, Middletown, Ohio

Send my copy of the Armco Tunnel Liner Catalog

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New steels are born at Armco

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This maintenance machine is not tied to your tracks

A fast, mobile L-W grader will help keep your right-of-way, yard, and road maintenance up-to-date. It can fix small troubles before they become major problems. Saves time, and the extra expense you'd incur, by postponing for work-train service.

There's no waiting for rail transportation . . . no need for special equipment or crews. One man, operating an Adams†, drives via highway, or on right-of-way, to handle work at various points along your line.

At the job-site, grader can cut and clean ditches, widen embankments, remove brush and weed growth. It can slope banks, level fill, build grade for sidings, spread ballast, grade access roads . . . clean-up around stockpiles, coal docks, shops, yards. Also plows snow, and handles many other jobs.

L-W Adams gives you more work-power

Size-for-size, LeTourneau-Westinghouse Adams graders provide more gear ratios and higher speeds than other graders. With more combinations of power and speed, your operator can always grade at, or near, full rpm engine power . . . can save extra time when backing-up, traveling and maneuvering.

Heavy-duty 80 to 160-hp L-W graders provide 15 full-power speeds to 26 mph . . . 8 forward, 4 reverse, 3 (optional) creeper gears. Utility-weight 60-hp model is also best in its class, with 10 speeds including creepers. And big 135 and 190-hp POWER-*Flow*® 550 and 660 models with torque converter give you the effective work-power of *infinite* gear ratios to 27.4 mph.

Optional equipment adds utility

Scarifier rips-up old asphalt, hard-packed dirt, roots, and stones. Dozer blade roots-out brush, pushes debris off right-of-way, backfills around culverts, cleans-up spillage in yards. Snow plow and wing clear heavy snow.

Ask us for complete information.

Slopes banks up to 90°

An L-W Adams grader is handy for erosion control along right-of-way slopes, or building new embankments. Blade shifts out and up to grade banks at any angle to 90° vertical, reaching 12½′ high. On the level, blade reach is approximately 7½′ beyond wheels.

†Trademark G-1886-RR-2/3

LETOURNEAU-WESTINGHOUSE COMPANY
Railroad Sales Division
Peoria, Illinois
A Subsidiary of Westinghouse Air Brake Company
Where quality is a habit

GUARD TO PROGRESS
RPI MEMBER

What's the answer? (cont'd)

and still others by advertising in trade journals. The designer should keep aware of all sources of information regarding these new materials. Unless the material has been tested either by time or accelerated test, its use should be questioned. If they are not proven, it is well in most instances to use the new material in the manner of a test. That is done frequently and often with satisfactory and economical results.

An ideal procedure would seem to be somewhat as follows:

After the need for a building or facility has been established by the official having jurisdiction, and proper request made for development of plans, the man assigned to handle same should make a careful study of the requirements.

Confer with those in charge of the activities to be accommodated.

In some cases visit the site of the work.

Secure a survey of the area.

Interview those who will actually use the facilities.

Develop preliminary plans in sufficient detail to obtain formal approval of all concerned and which can be used by estimators to determine the cost.

After authorization, complete the plans and any necessary specifications.

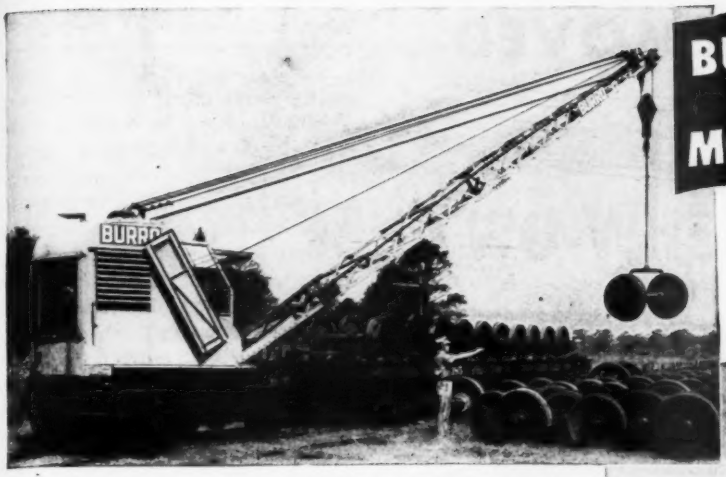
Make field checks of the work in progress. After the facility is in operation confer with those who use it, making note of any improvements that should be made either in arrangement or use of materials for any future similar facility.

Should inspect

By T. J. Engle
Engineer of Buildings
Chicago, Rock Island & Pacific
Chicago, Ill.

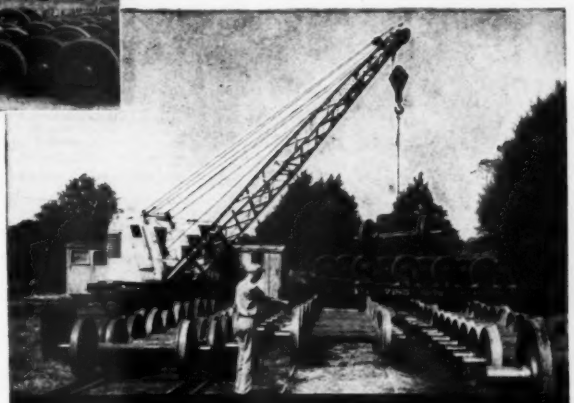
Ordinarily the railroad designer of our buildings inspects the structure after it is placed in service. This is especially important if it is of sufficient size or is an important unit in the operation of the railroad.

Occasionally this inspection is made by the designer shortly after the building is put in service, provided that the location is not too far distant and the trip can be made without tak-



BURRO WORK POWER means... MORE EARNING POWER

Unloading car wheels with a Burro. The Burro moved the flat car into position and will haul it away when wheels are unloaded.



This job—handling wheel assemblies in and out of storage—won't support high costs. That's why a Burro is doing the job.

***Any* job—on the line, in the yards, or Stores Department—can be done profitably with a Burro because Burros are fast, efficient workers with hook, magnet, tongs, bucket or dragline. Fast travel speeds and heavy draw bar pull enable the Burro to go to the job in a hurry—and even haul its own cars with it!**

Write for Bulletins and more information about Burro cranes. There is no obligation.

Represented In Canada by:
Sylvester Steel Products Co., Ltd., Lindsay, Ontario

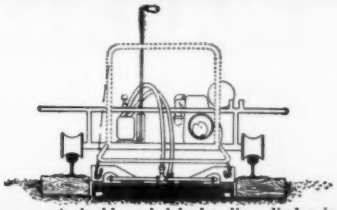
CULLEN-FRIESTEDT CO.
1301 S. KILBOURN AVE. CHICAGO, ILLINOIS

NO MORE TRENCHING!
NO MORE JACKING UP TRACK!

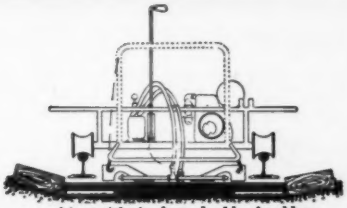
This WOOLERY TIE-REMOVING TEAM

NOW ELIMINATES SLOW, COSTLY METHOD

After the tie has been cut on both sides by the WOOLERY Tie Cutter, the operator of the Tie-end Remover—(who follows closely behind so that operators can assist each other in removing machines from track)—lifts the center section out with tie tongs.



A double-ended hydraulic cylinder is then lowered into the tie bed. A simple turn of the valve moves these two pistons outward, *pushing the tie-ends completely clear of the rail—whether working with single or double shoulder tie plates!* The crib is now open—and only the necessary amount of ballast is removed to admit the new tie.



Use the WOOLERY TIE-END REMOVER in conjunction with the improved model NU WOOLERY TIE CUTTER! It's the *perfect team* for greater savings on tie renewals—and gives *smoother, safer track, too!*

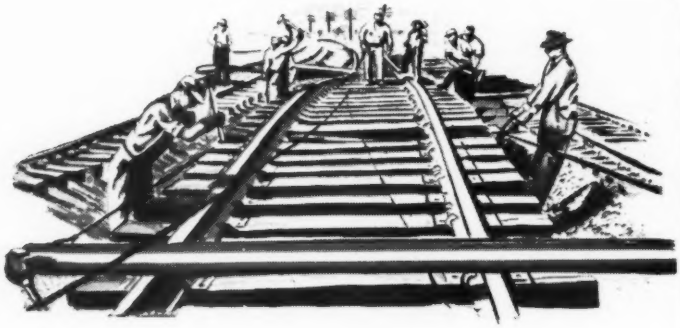
For highest efficiency two Tie Cutters should be used ahead of one Tie End Remover.

The trend toward heavier rail and double shoulder tie plates has made removing tie-ends increasingly difficult. With the WOOLERY Tie-end Remover, this task can now be done *in less than a minute by one man with no more effort than that required to turn a valve!*

WOOLERY
MACHINE COMPANY
2919 Como Ave. S. E., Minneapolis 14

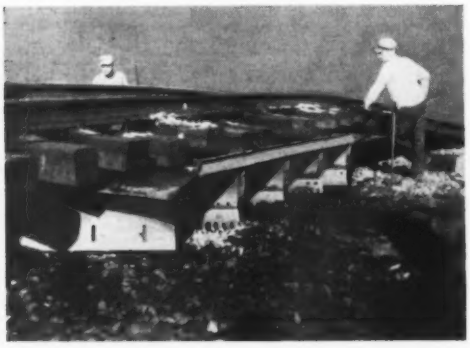
WORN TIES REMOVED

IN SECONDS...



As it plows out old ballast the Mannix Undertrack Plow performs another service! Track behind the plow is raised about 1 foot above roadbed level. This enables dead ties to be removed in seconds. New ties can be positioned just as quickly. It's one more way in which this proven Mannix equipment is saving time and money with "maintenance-of-way the modern way" on leading railroads.

. . . as you plow out ballast the proven MANNIX way!



Inquire about free showing of 16 mm. film on Mannix Plow (and Mannix Sled for raising track on new or old ballast). Ask for full details of Mannix service and special rental plan. A representative will call if you wish - no obligation.

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MINNEAPOLIS 16, MINN.
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MANNIX INTERNATIONAL INC.

What's the answer? (cont'd)

ing too much of his time. Otherwise, the inspection can be made up to several months after building completion. At that time the local people have gotten accustomed to operating in the building and any comments or suggestions made by them are more likely to be based on their experience in the use of the structure rather than on their personal opinions.

There are times when it is not convenient for the designer to make the trip. In this case someone else in the department, who is well acquainted with this particular construction, will make the inspection and then report on any objectionable features that may have developed after the building is put in service. The report would also include any disadvantages or additional advantages that might be evident from new materials or items of equipment that are being introduced and used for the first time on the railroad.

Inspections beneficial

By A. A. MELIUS
Architect
Northern Pacific
St. Paul, Minn.

To obtain a clearer understanding of the conditions which bring up such a statement it is necessary to go back a few years to the time when practically all railroad buildings were made from standard plans, standardized materials, and no deviation could be made unless permission was obtained from the top head of the department. Standard plans were the "bible" to be used and followed implicitly.

It is obvious that much of the work had to be this way and still is. With standardization there was less chance of error. Nothing could go wrong, it was all right here, it will be all right there. This developed a sort of smug attitude of satisfaction. Why change? This type of work needed no inspection after the job was completed. They were all alike.

At the present time some of the old attitudes remain, but these are gradually disappearing. Most railroads are conscious of the fact that buildings must be of good design, that the materials used shall be economical but still be of the best for good service and low maintenance. There are still

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PROJECT PAYDIRT pays off again*

NEW "ALL JOB" CAT NO. 619 225 HP TWO-WHEEL TRACTOR

First two-wheel tractor to deliver four-wheel speed and roadability!

Matched with new No. 442 Series B LOWBOWL Scraper for new high production... 14 cu. yd. struck, 18 cu. yd. heaped!

This new No. 619 Series B represents a major breakthrough in two-wheel tractor-scraper design. It is the first and only broad application two-wheel machine that combines two-wheel traction with four-wheel speed and roadability. It also affords new type unit construction and timesaving accessibility.

The No. 619's new turbocharged engine delivers 225 HP and a torque rise of 20%—for fast acceleration. With a top speed of 30.2 MPH, it can really run—and run under conditions that slow down other make two-wheel rigs.

That's because of its roadability. Advance Caterpillar design has achieved a tractor-scraper balance that "smooths out" rides to an amazing degree. This balance permits higher speeds for more cycles per day and less operator fatigue.

As for unit construction and accessibility, here's an example: A new swing-away dash allows ready access to the starting engine, air compressor and hydraulic pump. Entire left side of the engine can be exposed without having to disassemble any major components connected with the dash.

Like all achievements of Project Paydirt, the No. 619-No. 442 has been thoroughly tested. Four years of on-the-job operation prove this: This new "all-job" rig will set new performance records on a broad range of applications.

How much does this mean to you profit-wise? Of course, that depends on your jobs. But this is for sure. There's nothing like the new No. 619-No. 442 in the field today. Get the complete facts from your Caterpillar Dealer. Ask for a demonstration. See for yourself how it can step up production and profits on a wide range of applications.

Caterpillar Tractor Co., Peoria, Illinois, U.S.A.

* ***PROJECT PAYDIRT:*** **Caterpillar's multimillion-dollar research and development program — to meet the continuing challenge of the greatest construction era in history with the most productive earthmoving machines ever developed.**

ADDITIONAL FACTS ABOUT THE NO. 619-NO. 442

NEW NO. 442 SERIES B LOWBOWL SCRAPER has capacities of 14 cu. yd. struck and 18 cu. yd. heaped. Exclusive LOWBOWL design provides a faster loading rate with less resistance throughout the loading cycle. Also available is the 25-ton-capacity Athey PR619 Rear Dump Trailer.

UNIT CONSTRUCTION FOR EASY ACCESSIBILITY. The transmission, differential and cable control can be removed from the tractor as a single unit. The flywheel clutch can be removed as a unit with the engine in place.

PLANETARY FINAL DRIVES. By removing six capscrews in the planet carrier cover, each axle can be removed from the tractor. Use of planetary gears has contributed materially to the over-all accessibility of the unit.

OPERATOR EFFICIENCY IS INCREASED. New 2-jack steering system provides a greater amount of turning effort *coming out* of a turn than *going into* a turn. Also, for reducing ride motion, the Torsionflex seat is supplied as standard equipment.

WIDE RANGE OF APPLICATIONS. The new No. 619 fits equally well on small jobs or large projects. Whether it is called on for a low-yardage finishing job or to move material at high speed, the No. 619 is the right machine.

ALSO: Six-speed forward, two-speed reverse constant mesh transmission • Standard wide-base 26.5-25, 24-ply tubeless tires all around—optional treads and ply ratings available • Choice of in-seat gasoline starting or direct electric starting • New dry-type air cleaner • Fuel tank capacity—85 U. S. gallons • Shipping width—10 feet, 10 inches.

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BORN OF RESEARCH
PROVED IN THE FIELD

What's the answer? (cont'd)

quite a few buildings which can be and are standardized. These are satisfactory and need no inspection after being placed in operation.

The design of a new building is governed by the location, its use, and the materials with which it is constructed. Public opinion enters into the picture especially in the design of stations.

From the wording of the title I presume that there still are some railroads whose top personnel do not think it is very important to have the designer inspect his work. Definitely this is very important and necessary for any work which is different from the "standard plan." There is no way for the designer to obtain an unbiased viewpoint of his work than to make a personal inspection. Certainly criticism, either good or bad, made by an unqualified person does not produce a satisfactory solution.

With old materials being improved upon and new products being placed on the market from day to day, it is imperative that the designer be given an opportunity to examine his work and pass judgment as to whether the materials used were practical, satisfactory, and durable. In this manner we can separate the chaff from the wheat. It is a precaution which saves money on later work.

Colored photographs, both interior and exterior views, are always helpful for later references. A complete set of these photographs, either colored or black and white, should be kept on file.

Inspections can be made at a time when adjacent or nearby work is in progress and is to be inspected. However, if time is not available, we can always look over the work during vacation time.

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Preventing fires from hot boxes

When a car is set out because of a hot box, what measures should be taken to prevent the spread of the fire to the car and lading? Are the track forces responsible in any way? Explain in detail.

Use caboose chemicals

By J. C. Rouse
Roadmaster
Southern Pacific
Albany, Ore.

When a car is set out because of a "hot box," there are certain instructions of the transportation department to be followed.

Generally, each caboose has a supply of dry chemical to use in extinguishing a "hot-box" fire that is very effective and very little danger is to be experienced when used with care.

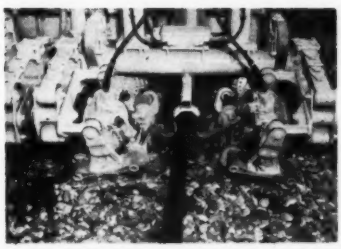
In case the fire has spread to the flooring underneath the car and is endangering the lading, it is generally considered good practice to stop the car adjacent to a roadway and summon a local fire department.

If the car is loaded with certain chemicals or explosives, it should be handled only by the most experienced people.

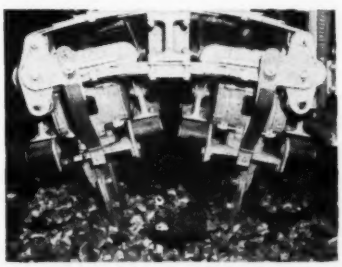
(Continued on page 60)

The JACKSON TRACK MAINTAINER

The Unrivaled Dual Purpose Tamping Machine!



Perfect consolidation of ballast right under the rail and from end of tie to specified distance inside the rail.



Nowhere will you find a tamping machine that closely rivals the JACKSON TRACK MAINTAINER in its dual function of quality production tamping and maintaining track of finest characteristics under all conditions; which accounts for the fact that the vast majority of leading railway systems in America use them in large numbers.

Each of its eight motors deliver FORTY-TWO HUNDRED 6000 lb. VIBRATORY BLOWS PER MINUTE to the tamping bars with the result that maximum ballast compaction is uniformly and continuously produced from the outer end of the tie through the vital load-bearing zone directly beneath the rail to the specified distance between the rails . . . the largest area, longest lasting tie bearing produced by any machine. And the JACKSON MAINTAINER does this with unmatched rapidity and uniformity. Let us supply the complete facts concerning this remarkable machine. Information on other JACKSON on-track and Manually Guided tampers sent on request.

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Clear the way of Bermuda grass

When Bermuda grass and trumpet creeper get a foothold, you're in for trouble and expense all along the right-of-way. In some places, they'll interfere with proper drainage, speeding up tie-rot and weakening the roadbed. In other locations they'll cause heaving or churning. And when it comes to tie replacement, they'll double your time and trouble.

That's why many modern railroads make short work of getting rid of both of these growing problems . . . with specialized Dow vegetation control chemicals.

Radapon®, for example, is especially designed to knock out tough, deep-rooted grasses like Bermuda. Sprayed on the leaves, it works down through the plant system and into the roots, breaking the grip of this troublesome grass for good. For control of trumpet creeper (cow itch, in some areas), 2-4 Dow® Weed Killer, Formula 40® does an effective job at low cost—and kills an army of other broad-leaved weeds at the same time.

These are only two of the specialized line of Dow chemicals that enable you to keep ballast, berm and rights-of-way clearer than ever before . . . at a cost that makes economy-minded management beam.

and trumpet creeper . . . *with Dow chemicals*

For more information about how Dow grass, weed and brush killers have become a vital part of modern railroading . . . and for the name of a qualified applicator . . . write to us today. You'll also receive a copy of an interesting new brochure, "Special Report to Railroads". THE DOW CHEMICAL COMPANY, Agricultural Chemicals Sales Dept., 202EG-5, Midland, Michigan.

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The new BANTAM carrier mounted Rail-Roader has 16,000-lb. lifting capacity to handle all kinds of construction and maintenance jobs: restringing, redecking, cap-changing, yard-loading, stockpiling, etc. It works with 11 BANTAM-built fast-change attachments to speed more jobs over a greater work range: pile driving, ditching, backfilling, tamping, erecting, placing concrete, grading, etc.

The patented BANTAM dolly wheel mounting is simple, foolproof—provides fast, easy moves on or off track at any grade crossing . . . rapid, safe rail travel in either direction. BANTAM's simplified mechanical controls give you dependable, fast-cycle operation in any weather. BANTAM builds its own carriers for this service, assuring greatest stability and mobility.

By all means, arrange a showing of this interesting new color movie. No obligation, of course.

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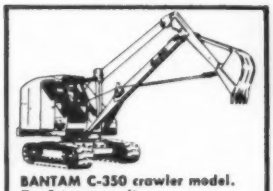

BANTAM C-350 crawler model. 7-, 8-ton capacity.

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What's the answer? (cont'd)

(Continued from page 56)

Also, section crews should be dispatched to unload part or all of lading. This will prevent spreading of fire and will enable the fire to be fought more effectively. Section crews should clear any grass or weeds away from the vicinity of the flaming journal or car to prevent the fire from spreading. In isolated localities and under questionable conditions, a member of the train crew, with whatever fire fighting equipment that is available from the caboose supplies, should be left with the "hot-box" car as a preventive measure until a section crew, car repairman, or fire department can arrive at scene.

Provide set-out spots

By I. D. ALLINDER
General Roadmaster
Kansas City Southern
Shreveport, La.

It is the responsibility of the train crew to set out the hot-box car, remove the burning waste, and extinguish the fire. This prevents further damage to the car and lading.

The responsibility of the maintenance department in the handling of such matters is to provide places along the main line for setting out the hot-box cars, where the waste can be removed and the fire extinguished in a safe manner. The places provided should have good footing and the maintenance department should keep this place free of any flammable materials, such as supplies, grass, weeds, etc.

All are responsible

By R. D. JACKSON
Supervisor of Track
Illinois Central
Clarksdale, Miss.

Hot boxes should be the responsibility of all employees of the railroad. Train crews should do all possible to extinguish all hot boxes. If the fire has reached such proportion that they cannot do it, then the dispatcher should be notified so he can call out the track forces to extinguish it.

At some locations, when a car with hot box has been set out, this fact is

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New Essolube HDX clings to bearing surfaces with a tough lubricating film that helps prevent wear and resists metal scoring under heaviest load conditions. From top to bottom, Essolube HDX keeps engines clean, keeps all moving parts free from carbon and varnish deposits.

When tested and compared (with a reference heavy-duty oil of higher than average quality) over one million miles of field tests proved Essolube HDX gave better lubrication in these vital areas:

- Bearings showed less wear from oil film breakdowns, and less corrosion from combustion by-products.
- Piston varnish deposits were greatly reduced, rings stayed clean and free acting – extending engine life.
- Anti-wear additive gave greater protection to cam shafts, valve lifters, bearings and gears.

Essolube HDX is another new product developed by Esso Research to reduce railroad maintenance costs. Specify Essolube HDX for maintenance-of-way and other equipment using small, high-speed engines. For more information, write: Esso Standard Oil Company, Railroad Sales Division, 15 West 51 St., New York 19, N.Y.

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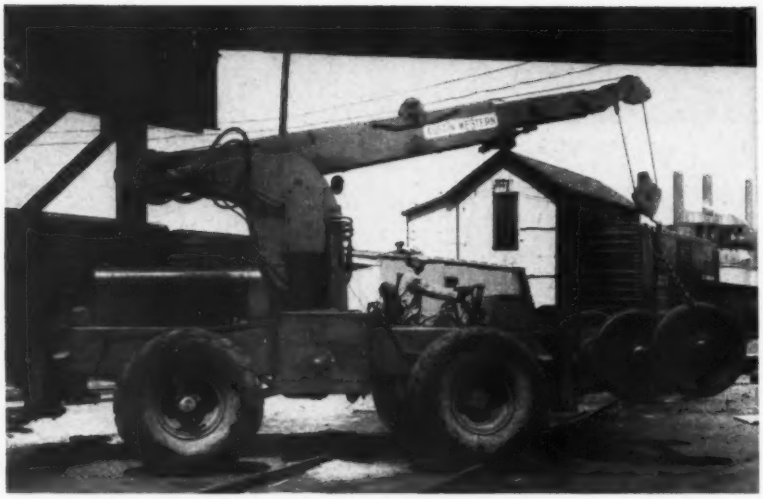


A-W Hydraulic Crane transports two 2500-lb. wheel and axle sets four times as fast in GM&O's Venice, Ill., repair yards. One set is carried on the boom, the other on front-end load-carrying platform.

Gulf, Mobile & Ohio nets $40,000 savings annually with two Austin-Western Hydraulic Cranes

Two Austin-Western Hydraulic Cranes do the work of 10 men and a tractor in Gulf, Mobile & Ohio's Bloomington and Venice, Ill., repair yards.

GM&O reports, " . . . we have an annual gross labor and equipment saving of $50,000 because of the A-W cranes. The cost of our two cranes is estimated at less than $10,500 annually for both. Deducting the cost of the small tractor, crane costs are reduced to less than $10,000. The net saving in the cost of car repairing in a year is over $40,000!

Safety factor important

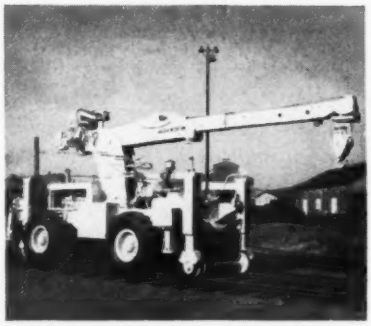
"Changing car doors and setting couplings, difficult and dangerous hand operations, are now done safer and faster by crane. The factor of extra safety alone probably justified use of the A-W, even if it did not also make such worthwhile savings.

"When our 25-ton locomotive crane was out of service for 10 days, the 5-ton A-W unit handled most of the essential jobs. During 1957 the A-W crane worked two shifts daily for 5 months rebuilding 400 hopper cars. Equipped with magnets on the 18-ft. telescoping booms, the A-W's keep the yards free of dangerous scrap metal.

Maneuverable, versatile

"The A-W is so maneuverable that it makes its way readily anywhere under all conditions. In spite of snow 18 in. deep and temperatures 6° below, the A-W stayed on the job in the unpaved repair yards at Venice. With all-wheel steering it can turn in less than its own length. Boom swings a full 360°. With all-wheel drive the A-W easily runs over raised rails.

"Several times a day the crane is used to spot cars, nosing them along with the boom end. There seems no limit to the chores we can do faster and more safely with the Austin-Western Hydraulic Crane!"



Equipped with Rail Crane Attachment, A-W crane can work on-or-off-track with equal ease.

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Power graders • Motor sweepers • Road rollers • Hydraulic cranes

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What's the answer? (cont'd)

noted the following day on the track crew's lineup of trains so the men may inspect the car to see that the fire has not broken out again. It is the responsibility of the track forces to inspect all passing trains for hot boxes, and notify the train crew, if possible. If this is not possible, they must call ahead and notify the train crew through an operator.

How to renew middle stringers

What method is the most economical for renewing the middle stringer of a three-timber chord of a pile trestle? Explain in detail and cite the advantages over other commonly used methods.

Remove outer stringer

By C. E. Dixon
Asst. Supervisor B&B
Maine Central
Portland, Me.

Briefly, our main-track timber-trestle design includes three stringers under each rail. The stringers are spaced 2 in apart by 2-in cast separators and are tied together in a chord by packing bolts. Also, they are secured to the bent caps by drift bolts. Normally, the ends of the stringers fall on every other cap with the joints of the middle stringers being staggered with respect to those of the inner and outer stringers. The bridge ties are 6 in by 8 in by 12 ft, spaced 6 in apart, with every fourth tie line-spiked to the outer stringer.

If we designate the middle stringer to be renewed as "A," and the two outer stringers which are adjacent to it as "B" and "C," the renewal procedure will be as follows:

First, remove the drift bolts and packing bolts of stringers A, B, and C. Next, pull the line spikes from stringers B and C.

You can now jack the deck up far enough to remove stringer C and to move one end (that nearest C) of stringer B outward. You are now ready to remove stringer A and to in-

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● Today, more and more men with maintenance on their minds will tell you . . . it's good business to protect lumber with PENTA treatment. Here's why:

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2. WON'T LEACH OUT — Because PENTA is an oil-borne rather than water-soluble preservative, it doesn't leach out, leaving wood vulnerable to rot and termites.

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Reichhold is a major supplier of PENTA to the wood industry and to wood users. If you haven't done so yet, investigate this modern method of protecting your lumber investments — write for the name of your nearest Reichhold distributor of PENTA.

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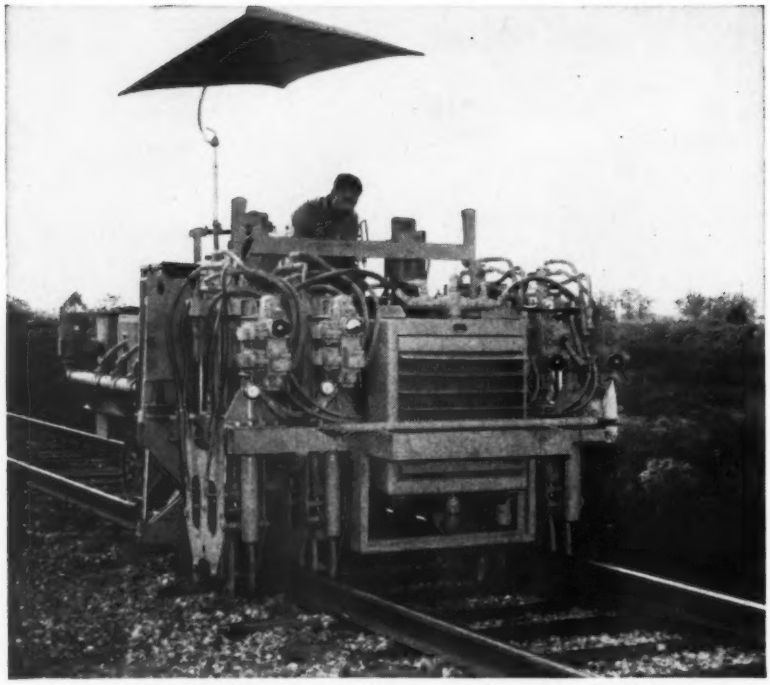
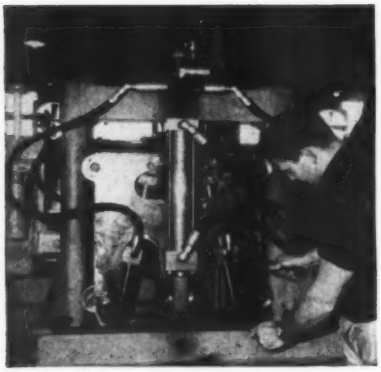


Kershaw multiple tamper at work on a section of reconditioned track.

"Aeroquip Hose Lines are the Best We Can Find for Our Machines"

REPORTS JOHN HOLLEY, CHIEF ENGINEER, KERSHAW MANUFACTURING COMPANY, INC., MONTGOMERY, ALABAMA



A workman installing Aeroquip Hose Lines on a Kershaw Super Jack-All. Hose and fittings are assembled quickly in the Kershaw plant.

Labor-saving track maintenance equipment is designed and built by Kershaw Manufacturing Company. Aeroquip Hose Lines with Reusable Fittings are used exclusively on all Kershaw equipment.

"Aeroquip Hose Lines are the best we can find for our machines," says Mr. Holley. "One advantage, we make up hose lines of any length, right in our shop. And, Aeroquip provides excellent hose replacement service throughout the country".

● Simplify your fluid line replacement needs with Aeroquip Hose and Reusable Fittings. Call your Aeroquip Distributor, or write us for full details.

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REG. TRADEMARK

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What's the answer? (cont'd)

sert another good timber in its place. Stringers B and C are restored to place and the hardware reapplied.

I believe this is to be the most economical method of renewing middle stringers of a three-timber chord of a main-line trestle. We have several other methods which we used on side-track and industry trestles. These differ by the location of the trestle being repaired, such as one located between buildings, or with a switch stand and platform on it for another side-track trestle. However, to explain these other methods would require a very lengthy article.

Jack up deck

By M. KLEIGLE
Master Carpenter
Chicago, Rock Island & Pacific
El Reno, Okla.

Where we have not adopted any standard plan or practice for this particular phase of bridge maintenance, the following procedure has been widely used by B&B forces on our railroad:

Our standard plan covering E-45 loading open-deck pile-trestle bridges provides we start the 3-ply chord with two short (or 14-ft) stringers in panel 1, then proceed with 3-ply chord using 28-ft stringers for the entire length of the bridge to the dump bent No. 2. There, we will again use either one 14-ft stringer or two 14-ft strin-ers, depending on the number of panels constructed.

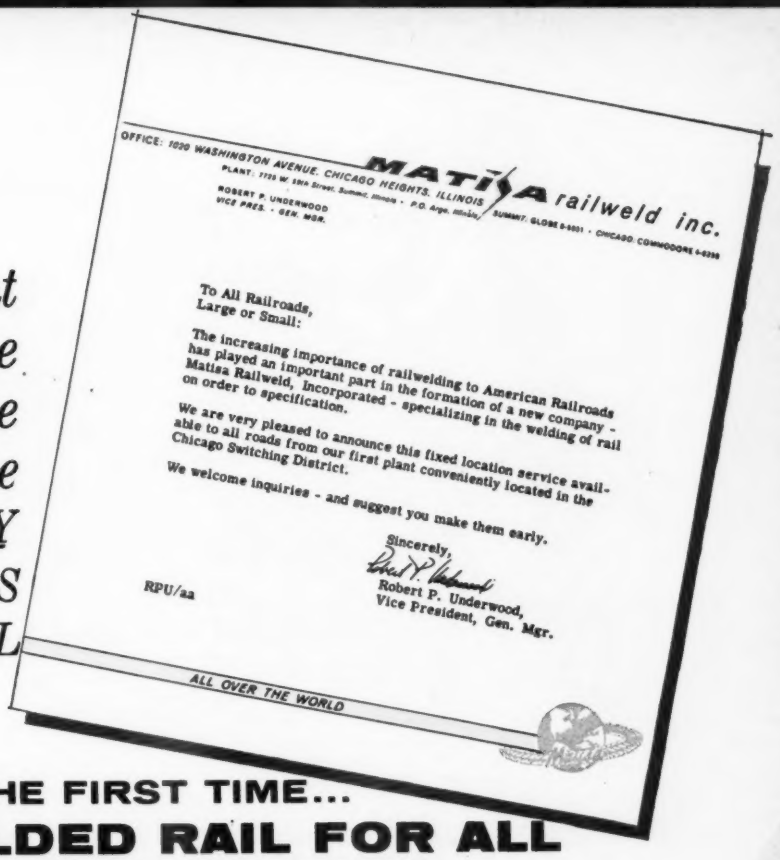
The procedure we use to renew stringer No. 2 is as follows:

1. Remove the chord bolts, anchor bolts, fastening angles and line bolts.
2. Jack the deck about 2 in high to clear the top of the chord, so the stringers can be easily removed, and block it on stringer No. 3.
3. Move stringer No. 1 workwise to the end of the caps. Then move stringer No. 2, which is being changed out, out to clear the end of the ties, and pick it up with a hand crane or derrick.
4. Place new stringer No. 2 on the cap and slide it into position. Restore stringer No. 1 to its position, then let the deck back down on the chord.

The bridge is then in safe condition to operate over at slow speeds. This is made possible by the reason that there are no anchors or fastenings removed from chord No. 2 during this entire procedure.

(Continued on page 66)

an announcement of major importance to all railroads, large or small, about the AVAILABILITY of CONTINUOUS WELDED RAIL



OFFICE: 1020 WASHINGTON AVENUE, CHICAGO HEIGHTS, ILLINOIS
PLANT: 7725 W. 59th Street, Summit, Illinois · P.O. Argo, Illinois/ SUMMIT: GLOBE 6-5601 · CHICAGO: COMMODORE 1-6396

MATISA railweld inc.

ROBERT P. UNDERWOOD
VICE PRES. - GEN. MGR.

To All Railroads,
Large or Small:

The increasing importance of railwelding to American Railroads has played an important part in the formation of a new company - Matisa Railweld, Incorporated - specializing in the welding of rail on order to specification.

We are very pleased to announce this fixed location service available to all roads from our first plant conveniently located in the Chicago Switching District.

We welcome inquiries - and suggest you make them early.

Sincerely,
Robert P. Underwood,
Vice President, Gen. Mgr.

RPU/aa

ALL OVER THE WORLD

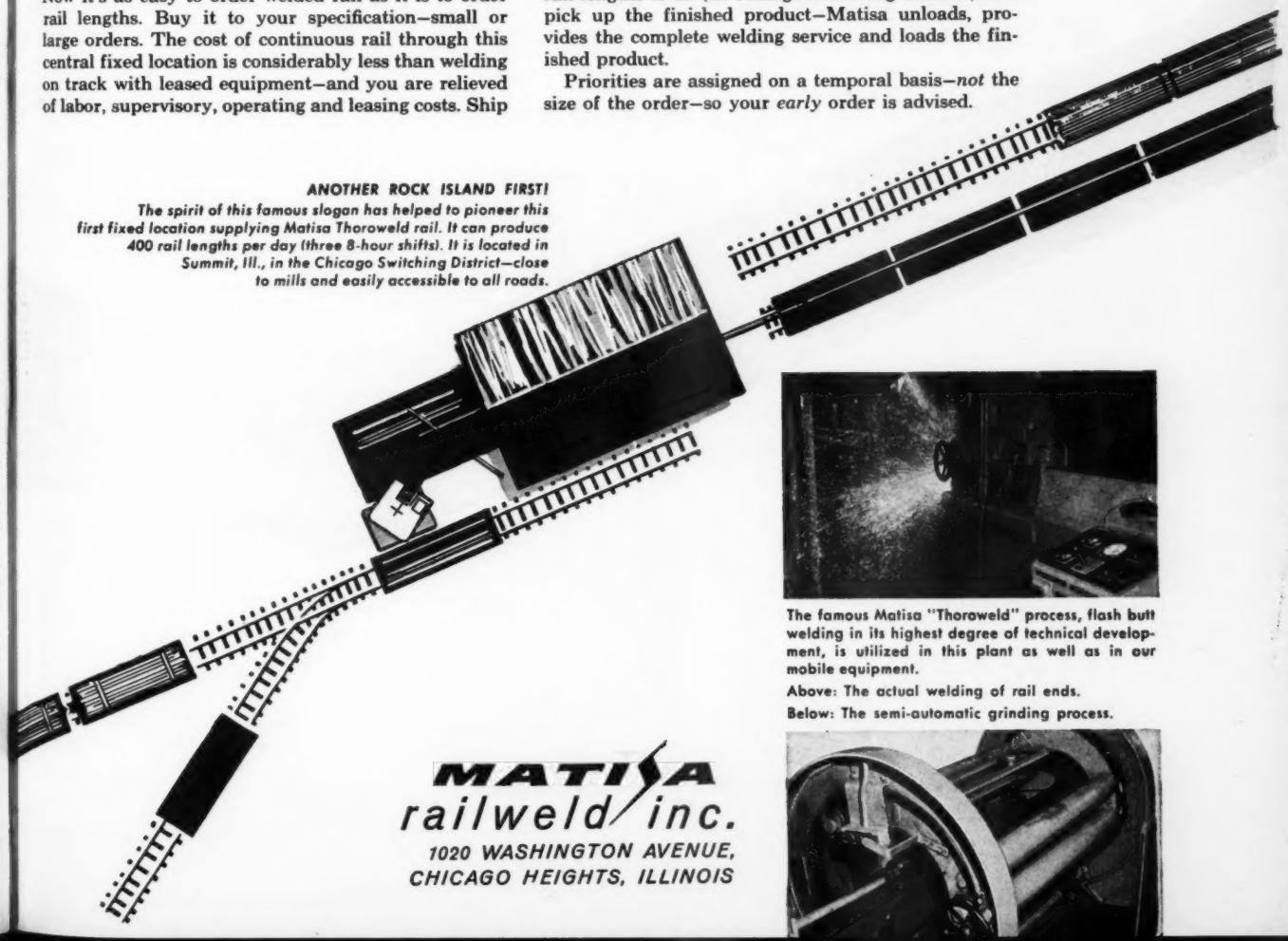
NOW AVAILABLE FOR THE FIRST TIME...

CONTINUOUS WELDED RAIL FOR ALL FROM A FIXED PLANT LOCATION

Now it's as easy to order welded rail as it is to order rail lengths. Buy it to your specification—small or large orders. The cost of continuous rail through this central fixed location is considerably less than welding on track with leased equipment—and you are relieved of labor, supervisory, operating and leasing costs. Ship rail lengths to us (in Chicago Switching District) and pick up the finished product—Matisa unloads, provides the complete welding service and loads the finished product.

Priorities are assigned on a temporal basis—*not* the size of the order—so your *early* order is advised.

ANOTHER ROCK ISLAND FIRST!
The spirit of this famous slogan has helped to pioneer this first fixed location supplying Matisa Thoroweld rail. It can produce 400 rail lengths per day (three 8-hour shifts). It is located in Summit, Ill., in the Chicago Switching District—close to mills and easily accessible to all roads.



The famous Matisa "Thoroweld" process, flash butt welding in its highest degree of technical development, is utilized in this plant as well as in our mobile equipment.

Above: The actual welding of rail ends.

Below: The semi-automatic grinding process.

MATISA
railweld inc.
1020 WASHINGTON AVENUE,
CHICAGO HEIGHTS, ILLINOIS

LONGER LIFE FOR YOUR TIES . . .

Flannery Tie Dowels prevent splitting and insure longer cross tie life. Applied while tie is squeezed together by hydraulic pressure, Flannery dowels close all cracks. Made of copper-bearing steel to resist rust and corrosion.

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RAILROAD SPECIALTIES
P. O. BOX 5103, NEWARK 5, N. J., Telephone MArket 3-0333 / PLANT: BAYONNE, N. J.

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. . . ON THE TOUGHEST JOBS
ARCTIC BOY
portable water coolers

. . . built to take a beating on construction jobs, in mines, on the farm, railroad crews, on service trucks . . . wherever men work and the going is rough.

They keep drinking water cool and sanitary, keep worker efficiency up. And note these features:

- HOT DIPPED Galvanized or stainless steel insets
- Sparkleen plastic liner . . . non toxic, prevents corrosion
- Large opening, easy to ice and clean
- Extra large insulation space

Send for free booklet "Care and Use of Your Cooler." Write Dept. C-53

DeLuxe

SCHLUETER MFG. CO. St. Louis, Mo.

What's the answer? (cont'd)

(Continued from page 64)

Usually it takes approximately 20 min for this entire operation. Trains can be operated over the structure at low speed until such time as the chords are fully bolted.

The time required for this operation will depend largely on the kind of tools that are provided for bridge work. With modern tools, such as nut runners, bolt pullers, and a crane, the entire job does not require more than 1½ hr for a gang of four men.

Biographical briefs (cont'd)

(Continued from page 10)

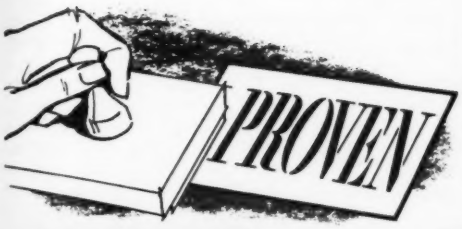
railroad service in 1943 by doing extra and summer work at Chicago and Memphis, Tenn. He was appointed assistant supervisor at Carbondale, Ill., in 1952 and promoted to supervisor track at Tutwiler, Miss., the following year. In 1956 he was transferred to Jackson, Miss., and the following year he was promoted to assistant to division engineer at Memphis. Mr. Croft was advanced to assistant engineer in the general office of the vice president and chief engineer at Chicago in 1958, the position he held at the time of his recent promotion.

Supply Trade News

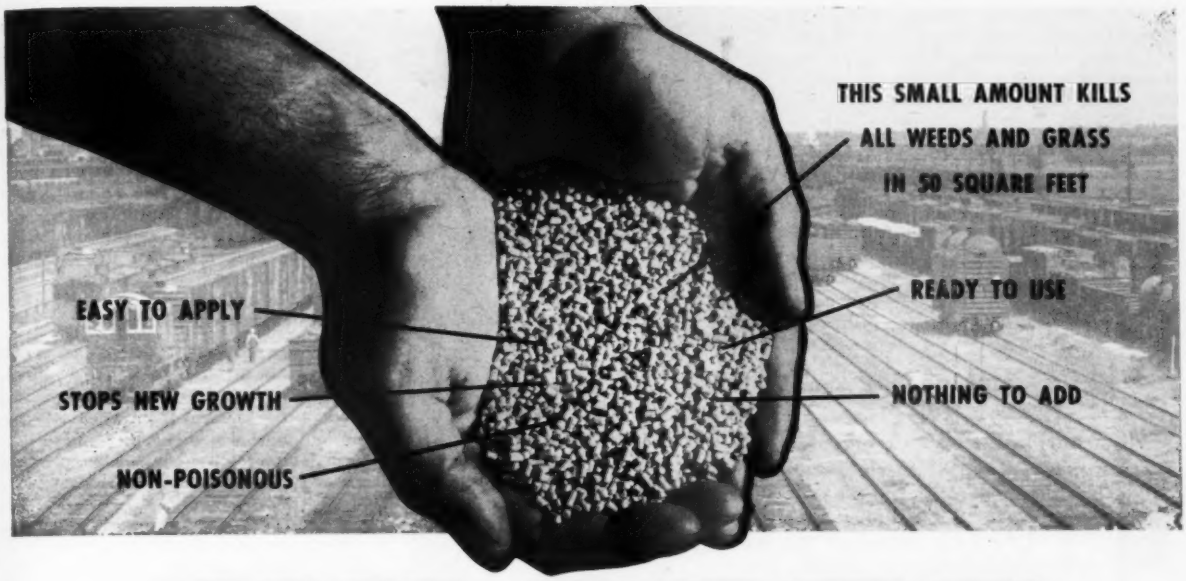
AMERICAN BRAKE SHOE COMPANY—**Roy A. Burt,** sales representative, Railroad Products Division, has been promoted to district sales manager with headquarters at San Francisco, Calif., succeeding **William N. Hulme** who has been promoted to manager of Brake Shoe Products. Mr. Hulme succeeds **John F. Ducey, Jr.,** who has been promoted to manager of new products. **William A. Wheeler,** sales representative at San Francisco, has been transferred to Chicago.

J. F. Ducey, Jr.
ABS

W. N. Hulme
ABS



WEED & GRASS KILLER



CHLOREA® GRANULAR

CHLOREA GRANULAR is a pelletized weed and grass killer. The pellets are ready for use . . . no mixing or adding of water is required. Application is easy to make with simple equipment, or by hand. These important advantages combined with powerful "kill all" effectiveness have been fully demonstrated by extensive use on many leading railroads.

Here are the important facts about Chlorea Granular:

1 Kills ALL weeds and grasses . . . stops new growth for a year or more.

2 Particularly intended for use where large scale spray application is impractical . . . such as freight yards, terminals, storage yards, under bridges and trestles, around warehouses, stations and other similar places.

3 Easy to use . . . apply with any mechanical type of granular material spreader; or broadcast by hand.

4 Low application rate . . . about 400 pounds to the acre . . . less where only annual vegetation is involved.

5 Contains 3 proven chemicals . . . this combination kills deep rooted weeds and grasses, as well as shallow rooted grasses, weeds and annual seedling growth.

SEND FOR FREE SAMPLE PACKET

CHIPMAN CHEMICAL COMPANY

World Leader in Chemical Weed Control Since 1912

RAILROAD DIVISION HEADQUARTERS

Dept. 6 A, 608 South Dearborn St., Chicago 5, Illinois

Supply Trade News (cont'd)

KERSHAW MFG. CO.—Election of four new members to the board of directors of this company and the appointment of three firms as agents to handle Kershaw products, has been announced by **Royce Kershaw,** president of the company and chairman of the board.

New directors are **Winton M. Blount,** president of Blount Brothers Construction Company, Montgomery, Ala.; **Edward O. Boshell,** New York industrialist and financier; **George L. Hudson,** president of Western Railroad Supply Company, Chicago; and **Fred Ball,** Montgomery attorney, who has been company counsel for many years. **Jeff W. Davis,** executive vice-president of Kershaw, continues as a director.

"The guidance of these well-known business leaders will prove invaluable to Kershaw Manufacturing Company in the establishment of our long-range programs and policies," Mr. Kershaw said, "and will assist us in providing even better products and service to the railroad field."

No stock transactions were involved in the election of the directors, said Mr. Kershaw, adding that "96 per cent of the common stock is and will continue to be held by the Kershaw family."

Mr. Kershaw also announced the appointment of the **Western Railroad Supply Company** as the exclusive agent for the Kershaw Car Inspector's Cart used by mechanical departments in the checking of railroad rolling stock. "Our present sales organization is designed to service the maintenance of way departments of America's railroads," he explained, "while the Car Inspector's Cart is for use by the mechanical departments. Consequently, we felt it would be better to have separate organizations calling on these two departments instead of our own people calling on both maintenance of way and mechanical customers."

Also announced was the appointment of **Donald J. Hogan & Co.** as sales agent for Kershaw maintenance-of-way products in the Chicago area; **R. M. Close,** St. Louis Railway Supply Company, as sales agent in the St. Louis area; **Lou Franco** as sales agent for the Pacific Northwest and Minneapolis and St. Paul area; and **W. C. McKay** as sales agent for the short line railroads. The new sales agents will serve the railroads in addition to existing Kershaw sales and service personnel.

LE TOURNEAU-WESTINGHOUSE COMPANY—**Wayne H. McGlade,** assistant to the executive vice-president, has been appointed product development manager—earthmoving and related equipment, for this company, according to an announcement by **Elmer E. Isgren,** executive vice-president. Mr. McGlade succeeds **E. W. Spannhake,** resigned.

Toole Corporation, 6615 Corson Ave., Seattle, Wash., has been appointed distributor for the complete line of this company's earthmoving, hauling and grading equipment in Washington.

NATIONAL ALUMINATE CORPORATION—As this issue was going to press, this company announced that at its annual meeting, which was to be held at Chicago on April 27, a recommendation would be made to the stockholders for approval to change the name to **Nalco Chemical Company.** In making the announcement, **Joseph A. Holmes,** president of the company, said, "The name change has been under consideration for several years. The Board of Directors is recommending the change because the new name would more clearly reflect the diversified nature of our business and products." The company and its subsidiaries produce special chemicals that are widely used throughout industry. Among these are both dry and liquid chemicals for weed control.

PORTLAND CEMENT ASSOCIATION—This association has announced that on January 1 it began field service activities in northern California with the opening of an office in San Francisco. **Charles F. Moran,** structural engineering specialist, and **Robert E. Jones,** paving engineer and general field engineer, formerly with the Los Angeles office, have been assigned to the San Francisco office which is located in Room 415, Russ Bldg., 235 Montgomery Street.

E. G. Robbins has been appointed acting manager of the soil-cement bureau succeeding **J. A. Leadabrand** who has been promoted to assistant to the vice-president for promotion. Mr. Leadabrand succeeds **Thomas E. Long** who has been appointed Eastern Regional manager.

Another BorTunCo Success Story:

BorTunCo has an established record with engineers and contractors for capable sub-contract job performance.*

179,115 feet of **bores** and **tunnels**—ranging in size up to 12 feet in diameter—were completed in 1958 by **The Bortunco Group.**

Work was completed in **23 states** for 511 satisfied customers!

The Bortunco Group is the answer to your boring and tunneling problems. Call our nearest office for quote on your next job.

*Negotiations and inquiries strictly confidential.

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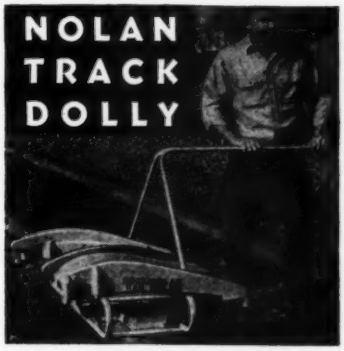


You can get rails, ties, supplies, tools, rerailers, etc., to the job with money-saving speed and efficiency, when you equip your crews with the Nolan Track Dolly.
Built of tubular high-carbon steel. Extremely strong and serviceable. Operator's handle conveniently placed to assure correct balance and full control of heavy loads.

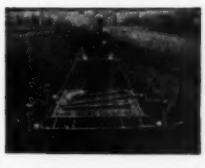
STANDARD DOLLY

Length	Width	Ht. Above Rail	Weight
50½ in.	15½ in.	6⅝ in.	88 lbs.

INSPECTOR'S DOLLY

Length	Width	Ht. Above Rail	Weight
36 in.	14 in.	6 in.	60 lbs.

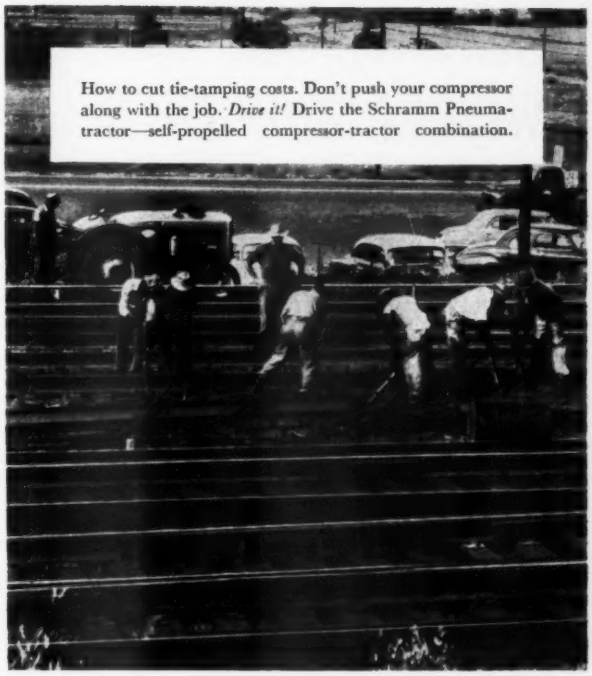
NOLAN TOOL AND SUPPLY CAR



2000 lbs. capacity. All-tubular high-carbon steel construction for safe carrying of ties, rails, supplies, etc. Car breaks conveniently in center into two sections.
Platform size 48" x 45" Ht. above rail 8" Weight 140 lbs. complete.

Write for complete railway supply catalog.

THE NOLAN COMPANY
166 PENNSYLVANIA ST., BOWERSTOWN, OHIO



How to cut tie-tamping costs. Don't push your compressor along with the job. *Drive it!* Drive the Schramm Pneumatractor—self-propelled compressor-tractor combination.

HERE'S AN AIR COMPRESSOR THAT'S DIFFERENT!

Schramm Pneumatractor is a 125 cfm compressor—drives on-track, off-track under its own power.

Look closely at competitive air compressors today. You'll find designs are similar, engines are similar, ratings are similar, costs are similar. Now, at last, there's an air compressor that's different—Schramm Pneumatractor—self-propelled 125 cfm compressor, built like a tractor. It drives to the work, along with the work . . . on-track or off-track. No breaks, no lost time while crews knock off and wait for the compressor to be towed or pushed to the next location. And no "work momentum" lost in picking up again. Yet Pneumatractor still costs *less* than any maintenance-of-way portable.

Next time you plan to buy an air compressor, investigate the compressor that's different from all others—Pneumatractor. In the meantime, get complete information by writing for your free copy of Bulletin RRP-56.

Schramm, Inc.
MANUFACTURERS OF AIR COMPRESSORS
732 North Garfield Ave. • West Chester, Pa.

Pneumatractor drives along with work, on-track, off-track. Costs less than any maintenance-of-way portable.

Self-Propelled

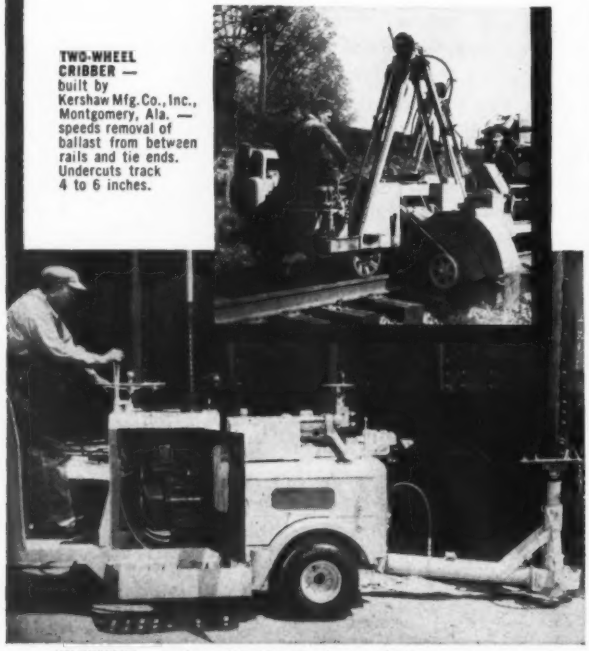
WISCONSIN-POWERED

equipment speeds work ... cuts costs in maintenance of way

You can maintain more miles of way — save time and cut cost every foot of the way — with Wisconsin-powered equipment. Self-propelled machines (like the two shown) speed men, tools, and materials to and from track jobs. They provide dependable on-the-job power that enables you to get along with less equipment — and to turn manhours into cost-cutting workhours.

Wisconsin heavy-duty, air-cooled engines start fast — deliver steady workpower that keeps men and machines busy around the clock, in any kind of weather. Air-cooling packs more power with less heft. You don't have to worry about summer dry-ups or winter freeze-ups — and you have up to 26 fewer parts to repair and to replace.

Specify Wisconsin-powered equipment for work- and cost-saving year-around maintenance of way. Write for Bulletin S-237 covering the entire line of Wisconsin heavy-duty, air-cooled engines — 3 to 56 hp. Single-, 2- and V-type 4-cylinder. All available with electric starting.

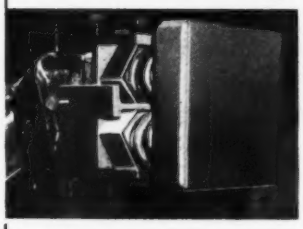


TWO-WHEEL CRIBBER — built by Kershaw Mfg. Co., Inc., Montgomery, Ala. — speeds removal of ballast from between rails and tie ends. Undercuts track 4 to 6 inches.

YU-BRASSER — made by Yuba Mfg. Co., Benicia, Calif. — enables one man to lift journal, remove and trim brass, open oil rolls, and replace brass on the spot in less than 5 minutes.

WISCONSIN MOTOR CORPORATION
MILWAUKEE 46, WISCONSIN
World's Largest Builders of Heavy-Duty Air-Cooled Engines

Absorbs shock without disturbing the track



Hayco Shock-free Head with patented inner design builds gentler car handling, longer life into your rigid bumping posts.

Five years of in-track performance highlight these facts about the Hayco Shock-free Head: (1) It effectively dampens impact shock—prolongs bumping post life. (2) It gives the draft gears a better chance to function—minimizes damage to cars and lading. (3) It substitutes compressibility for rigidity—tends to keep cars from bouncing, to prevent derailments.

The Hayco Head (applied with a wrench) fits nearly all bumping posts now used. It saves you money every time it is hit. Ask for Cir 115.

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The Brice Hayes Co.
6710 NORTHWEST HIGHWAY
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Ease the strain of

pounding wheels!

Install Improved Hipower Spring Washers to ease the stress and strain created by constant, heavy traffic. NATIONAL spring washers absorb shocks by equallizing bolt tensions, and protecting rail ends and joints. Improved Hipowers are designed to provide reserve power for lasting effectiveness, reducing maintenance all along the line!

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A COMPLETE LINE OF
RAILWAY SPRING WASHERS

The NATIONAL LOCK WASHER COMPANY

Serving Industry Since 1886 — NEWARK 5, NEW JERSEY, U. S. A.

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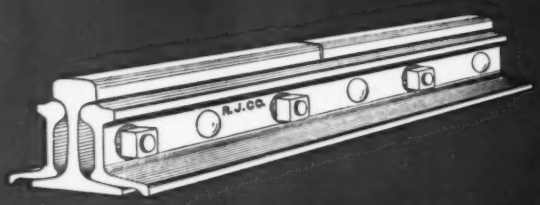
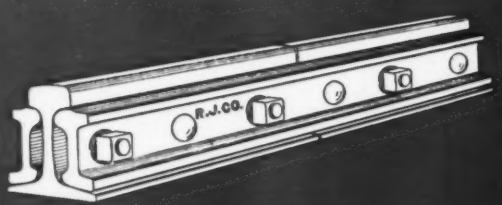
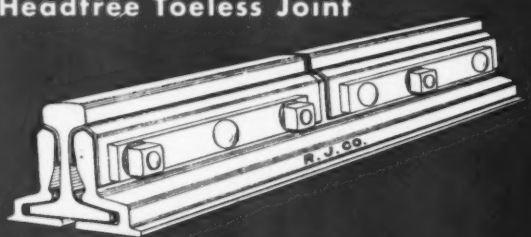
Designed for those who demand the best



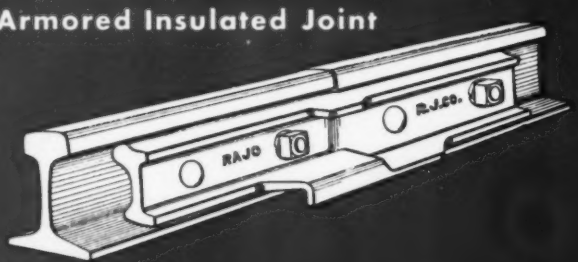
Headfree Flanged Joint



Headfree Toeless Joint



Armored Insulated Joint



Rajo and Compromise Joint

FOR OVER SIXTY YEARS the Rail Joint Company has specialized exclusively in the design and manufacture of rail joints. The most notable improvements include the better distribution of metal, longitudinal reinforcing rib, vertical ribbing of the joint bar, introduction of the head-free feature and the more recent refinements such as head easement and curved base beveling, all of which have materially contributed to a better rail joint.

The Insulated Joint offers the all-important feature of providing an integral support under the rail bases, thus securing maximum bearing surface for the insulation and insuring its relatively long life if the joint is correctly applied and maintained.

Rajo Compromise Joints connecting rails of different sections or those of the same section having varying amounts of vertical and/or lateral wear are of an improved and modified angle bar design, with the metal so distributed as to offer maximum strength at the joint center where the greatest stresses occur.

RAIL JOINT COMPANY

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